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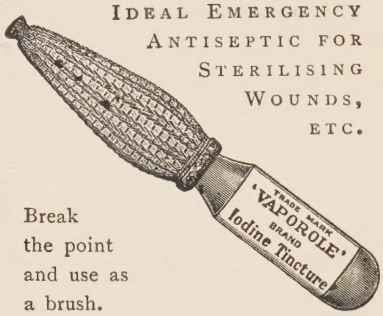

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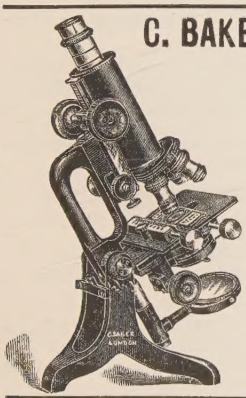

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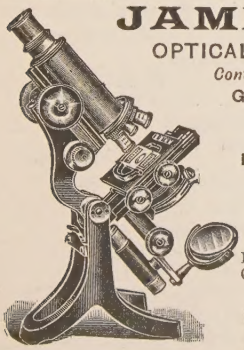

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 7.] 1916. [No. 1.

YAWS.

BUTLER (C. S.). **Some Facts and Some Fancies regarding the Unity of Yaws and Syphilis.**—*U.S. Naval. Med. Bull.* 1914. Oct. Vol. 8. No. 4. pp. 561–571. With 1 plate.

The author remarks, " in extenuation of my presuming to bring in question the matter of duality of viruses between yaws and syphilis, I will say that I myself am inclined to the side of duality, but that in seeking an explanation for many observed facts, the open mind attitude compels the admission that I am uncertain and that many facts are better explained on the basis that yaws and syphilis are but different clinical manifestations of the same disease."

After this preliminary the writer brings forward a number of interesting observations and arguments in support of the latter view and discusses them under the following heads: (1) Epidemiologic and climatic, (2) pathologic, (3) symptomatic, (4) therapeutic, and (5) immunologic.

With regard to its distribution, the strict limitation of yaws to the tropics is considered to be one of the strongest indications that in it we are simply dealing with syphilis. There is no other inoculable and contagious disease requiring no intermediate host which is thus delimited.

With regard to the statement that yaws is generally a non-venereal disease, the author remarks that he has never seen such admirable conditions for the transmission of innocent syphilis as exist among the lower class natives of the Philippines, and TARNOWSKY's statement is mentioned that in certain parts of Russia 70 per cent. of the cases of syphilis are non-venereal in origin.

On histological grounds it would seem to be impossible to differentiate yaws from syphilis, for the lesions cannot be distinguished with any degree of certainty.

The author performed the interesting experiment of inoculating a human case of syphilis in the secondary stage, with material from a case of florid yaws. The result was entirely negative (with the exception of an apparent allergic reaction) up to the time of writing, a period of ten months.

Certain authors have reported the rather frequent occurrence of yaws following syphilis or vice versa, but the experience of the naval

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medical men at Guam is against this statement. In that island, although about 90 per cent. of the rural population has yaws at some time during life, no case of primary or secondary syphilis has been observed during fourteen years.

[The original paper should be consulted by those interested in this subject as the question is discussed in some detail.]

E. Hindle.

i. Garrow (Alexander). **Syphilis or Yaws?**—*S. African Med. Rec.* 1915. Apr. 10. Vol. 13. No. 7. pp. 89–95. With 1 plate.
ii. de Vos Hugo (D.). **Syphilis or Yaws?**—*Ibid.* Apr. 24. No. 8. pp. 107–109. With 2 figs.

i. In this article the writer discusses a disease in the Northern Districts of South Africa, which has been regarded by certain doctors as native syphilis and by others as yaws or a disease resembling yaws. This disease is very common in the Kimberley District and the author has made notes of 50 cases. Many of these cases are described in detail and from the descriptions there seems to be little doubt of their being syphilitic and not yaws. In conclusion it is suggested that, as the matter is one of sufficient importance to demand investigation, it would be well if a bacteriological enquiry into the matter were instituted.

ii. A polemical article in which the writer brings forward evidence in support of his view that a disease closely allied to, if not identical with yaws, exists side by side with syphilis in South Africa. In an addendum Garrow's paper is criticised, and the writer considers that the arguments there advanced in support of the true syphilis theory are not convincing, for they show that the disease is usually different from typical cases of syphilis such as occur in Europe.

E. H.

i. Duprey (A. B.). **The Management and Treatment of Yaws exemplified by Two Cases.** [Correspondence].—*Lancet.* 1915. June 12. pp. 1260–1261.
ii McDonald (W. M.). **Salvarsan in the Treatment of Yaws.**—*Ibid.* Sept. 18. pp. 649–650. With 2 figs.

i. The writer calls attention to some of the methods of dealing with yaws cases in the British West Indies. Segregation is the chief object desired and ordinances are passed to drive infected patients into special hospitals, and yet in some cases the patients leave the hospitals still carrying well-marked nodules.

The decrease in the prevalence of yaws is stated to be associated with the advance of scientific agriculture and corresponding improved conditions.

The writer remarks that although there is no difficulty in finding the syphilis spirochaete, he has never yet been able to obtain the organism of yaws. The latter is considered to be purely and simply a contagious skin disease and to have no relation whatever with syphilis.

The virtues of arsenical preparations are next discussed and the writer states that much less dangerous compounds of arsenic than salvarsan, intelligently used, have the same effect. The dangers of salvarsan in the hands of unskilled operators are then exemplified by

a description of two cases, in one of which the patient died as a result of aggravated kidney troubles and in the other an abscess was formed at the site of injection, resulting in the damagement of the sciatic nerve and consequent weakness of the leg and foot.

[In spite of this correspondent's pessimistic views there seems no doubt whatever that the treatment of yaws by intravenous injections of neosalvarsan gives far superior results to those obtained by any other method.]

ii. The writer strongly opposes the statements in DUPREY's letter, and shows that the salvarsan treatment of yaws is " one of the greatest benefits which the medical [*sic*] profession has ever conferred on tropical countries." Two good photographs are given showing a case of yaws before and after treatment with salvarsan.

E. H.

SPAAR (E. C.). **Notes on Three Cases of Parangi, treated with Dr. Castellani's Mixture.**—*Jl. Trop. Med. & Hyg.* 1915. Aug. 2. Vol. 18. No. 15. pp. 170–171. With 2 text-figs.

The description of three cases of yaws treated in Ceylon with CASTELLANI's mixture [see this *Bulletin*, Vol. 5, p. 422]. In all three cases the treatment was very satisfactory, improvement taking place within a very few days, and each patient was cured from two to three weeks after the treatment was commenced.

E. H.

SPRUE.

ASHFORD (Bailey K.). i. **A Monilia found in Certain Cases of Sprue. Preliminary Note.**—*Jl. Amer. Med. Assoc.* 1915. Mar. 6. Vol. 64. No. 10. pp. 810–813.

ii. **Relation of the Genus "Monilia" to Certain Fermentative Conditions of the Intestinal Tract in Porto Rico.**—*Ibid.* June 5. No. 23. pp. 1893–1896.

iii. **Is Sprue a Moniliasis of the Digestive Tract? Institute of Tropical Medicine and Hygiene of Porto Rico.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. July. Vol. 3. No. 1. pp. 32–46. With 2 plates.

i. While studying four cases of sprue in Porto Rico, the author isolated from the inflamed tongue a Monilia which he considers to be a different species (as distinguished by its cultural characteristics and its behaviour with solutions of various sugars) from any hitherto described by the reviewer or other investigators of this disease.

He was unable to obtain similar cultures from normal tongues or from other cases of sprue in which the tongue was not involved. The amount of acidity produced by culture of the organism in sugar solutions was determined by titration according to the method advocated by the Bacteriological Committee of the American Public Health Association. A hypodermic injection of a ten-day culture of this yeast into the muscular tissue of the tongue killed a large rabbit in seventy-five hours; after forty hours a severe diarrhoea with the production of much gas supervened. Death occurred from a generalized infection. Cultures made with strict aseptic precautions from the internal organs and heart's blood and also from the tongue yielded positive growths of this yeast. An abundant growth was also obtained from the mucoid layer of the stomach and small intestine. Further details of this interesting experiment are promised shortly.

[According to the reviewer's experience it appears to be unscientific to rely on the sugar reactions of the Monilias with a view to their classification. From the research on sprue he was privileged to take part in, and which is now published in full, it will be seen that Monilias intensely pathogenic to rabbits were frequently isolated from sprue tongues both during life and post mortem.]

P. H. Bahr.

ii. In this second paper Ashford gives some account of the particular species of Monilia which he is inclined to regard as an etiological factor in the production of sprue. It causes an acid reaction on glucose, laevulose, maltose, saccharose and galactose. It does not liquefy gelatin or serum and it renders milk alkaline.

Five drops of a pure culture were injected into the tongue muscles of a large Belgian hare, which died 75 hours thereafter with enormous production of intestinal gas and diarrhoea but without sore tongue. The organism was recovered after death from practically all the organs.

"The same organism—which, by the way, was one isolated from the tongue of one of our most beloved officials of the American Government here, and which not long since caused his death—was fed in pure culture to a one-thousand gram guinea-pig, causing, I suspect, its death three

weeks thereafter. Cultures from the organs of the body, save tongue and stomach, however, were very disappointing, and the histopathologic picture in its intestines and stomach has not yet been worked out for lack of time. This animal also suffered from gas and diarrhea. Cultures of this organism with malted milk were fed during a time to a monkey. This monkey is still alive . . . . it is rapidly declining in health, becoming thin and sick, with occasional sharp diarrhea. The last word must yet be said on this animal."

The author has not found *M. albicans* in Porto Rico.

iii. The same writer gives an extremely vivid account of the clinical symptoms shown by sufferers in Porto Rico from " fermentative indigestion " and by cases of actual sprue. It was difficult to say where sprue began and the other ended. Hitherto the diagnosis of sprue required the presence of four cardinal symptoms: (1) A typical tongue; (2) a gaseous bowel; (3) the characteristic stools; and (4) a small liver; but in the author's view there is a " tongue " sprue, an " intestinal " sprue and complete sprue " with a bewildering shifting of the scene from bowel to tongue and back again in the shortest possible time." The writer gives an interesting description of the clinical characteristics as they affect the tongue, the stomach, the liver, pancreas and intestine. The blood picture shows little. The leucocyte count is normal or slightly reduced with a relative increase of the lymphocytes. The tongue lesions are often clinically and histopathologically indistinguishable from ordinary thrush, a disease due as a rule to *Monilia albicans.*

The writer had an opportunity of studying the epidemiology of sprue. In San Juan sprue was very prevalent, whereas in the mountainous districts only a very few cases of true sprue and only a few sprue suspects were detected. In the mountains the people rarely ate bread whereas in San Juan it is a staple food. " Its quality has in many places deteriorated being now sour, sodden and of unusual taste." Coincidently sprue has increased in frequency. The communicability of sprue is also evident from the number of family endemics observed. Cultures were made from the tongue, and stools of 197 persons; 49 were distinctly cases of sprue and in all there was a Monilia, not *M. albicans* but one of a hitherto undescribed species: 92 were cases in which gastro-intestinal disturbances ranged from mere vagaries to serious disease, chiefly accompanied by excessive gas production; 17 per cent. of these harboured the same fungus. Sixty-six persons apparently normal were examined and only 3 per cent. harboured this Monilia. The organism was pathogenic for small laboratory animals, causing diarrhoea by injection into the peritoneum and excess of intestinal gas by feeding experiments. This Monilia was also isolated from the centre of a loaf of bread from an endemic focus. Complement fixation tests in a series of normal persons were negative, but in a few cases of sprue positive results were obtained.

J. C. G. Ledingham.

Gabbi (Umberto). **Sulla presenza di casi autoctoni di sprue nella Calabria e nella Sicilia. Primo Contributo Clinico.** [On the Occurrence of Autochthonous Cases of Sprue in Calabria and Sicily.]—*Malaria e Malat. d. Paesi Caldi.* 1915. Mar.-Apr. Vol. 6. No. 2. pp. 81–88: and *Pathologica* 1915. Apr. 1. Vol. 7. No. 154. pp. 153–158.

In this communication, Professor Gabbi records observations, made some years ago, on three apparently indigenous cases of a malady which presented all the characteristics of tropical sprue. They were met with in Calabria and Sicily and one of the writer's chief aims is to draw the attention of his medical colleagues in Southern Italy to the presence of this disease and to point out the dangers involved by its possible diffusion. The following are brief notes of the cases:—

Case 1.—Female (32). Father had been gouty and suffered from arteriosclerosis. Mother and a brother also gouty, the latter also neurasthenic. No maladies of any importance in past history. Married, with healthy family. No tubercle or lues in family history. In 1911 the appearance of buccal thrush was noted. Tongue red. Unusual sensation of sourness in mouth. Other disturbances followed. Feeling of heaviness after eating, troublesome eructations. Frequent desire to defaecate. Stools liquid, foetid and small in quantity. No smarting in anal region. These disturbances not accompanied by fever. They were considered by the physicians as gouty manifestations and appropriate drugs prescribed including urotropin, astringents and consumption of Vichy water. The case did not improve. Thrush increased and became diffused over the throat and possibly extended also to the oesophagus as there was a feeling of smarting during deglutition. Symptoms increased and patient became weak, emaciated and anaemic. When the patient was first seen by Gabbi, he was unable to formulate a definite diagnosis. At his second examination of the patient, the skin was dry and inelastic, the gums tumid and red, saliva abundant and acrid. No organic lesion in circulatory or respiratory systems. Slight pain over epigastrum. Spleen normal. Liver slightly enlarged. No albumin or sugar in urine, no mucus or blood in stools. Thinking again that the condition was of gouty origin, alkaline waters were prescribed, also astringents and mouth disinfectants. The malady however progressed and ended fatally. Menses continued to the end.

Case 2.—Female, 34. Gouty heredity. Married with healthy children. In 1911, she commenced to have an acid taste and feeling of heat in the mouth. Buccal thrush spread, tongue and gums red, troublesome eructations. Intestinal disturbances followed, diarrhoea with yellowish foetid stools. Teeth began to give trouble. Gout was considered to be the cause of the malady and appropriate treatment prescribed. She did not however improve. Skin became pallid. Finally she was put on a milk diet, fresh vegetables, etc., and proceeded to recover very slowly.

Case 3. Male, 40. Symptoms very similar to those of above two cases.

From a consideration of his cases Professor Gabbi summarises the symptoms thus: 1st Period. Slow insidious onset characterised by dyspepsia and swollen-up feeling in epigastrium. Eructations after eating. Diarrhoea with pultaceous, greenish-yellow, foul-smelling stools. 2nd Period, characterised by the spread of buccal thrush. Sour taste in mouth. Several motions (4–6) per day. Anaemia, disappearance of fat, no fever. Skin dry and inelastic. Alternate improvements and relapses. Cure may result or death may take place through aggravation of intestinal disturbances, uncontrollable vomiting, syncope or some grave complication.

The syndrome affects adults and especially females. When in this country last year Professor Gabbi had been unable to see any cases of sprue in the hospitals attached to the London or Liverpool tropical schools, but recently he had an opportunity of seeing a similar case in Rome, a lady returned from Saigon.

In Egypt, India and Syria the disease has been noted. In Bombay, Calcutta and Colombo there are endemic foci and owing to the important commercial relations that subsist between these cities and English and Mediterranean ports, especially Messina and Naples, it is not unreasonable to suppose that the germs of sprue may be transported either in merchandise or by affected members of the crew. Gabbi's cases occurred in merchants' families living in maritime cities. He recommends that port medical officers should enquire into slight cases of diarrhoea on board ship and, in this way, some light might be thrown on the mode of diffusion of this chronic and sometimes lethal malady.

J. C. G. L.

Brau (P.) & Nogue. **Sur la diarrhée chronique dite diarrhée de Cochinchine.**—*Far East. Assoc. Trop. Med. C. R. Trois. Congrès Biennal. Saigon* (*1913*). 1914. pp. 83–91.

The authors draw attention to the existence of renal insufficiency in persons suffering from the chronic diarrhoea (? sprue) of Cochin China and give directions for its treatment. Evidence of renal troubles is supplied by local or general oedema, and albuminuria may or may not coexist. Syphilis or alcoholism may certainly cause the nephritis in some patients, but others do not appear to have had any affection capable of injuring the kidneys other than the intestinal trouble. With regard to the etiology of these cases, which present as near as possible the classical symptoms of sprue, one of the authors has made during the past three years daily examination of stools for intestinal parasites, helminths or protozoa. Almost always in the frothy yellowish stools of these cases, one finds very motile amoebae presenting all the characters of the type described by Schaudinn, with the exception of red blood cell phagocytosis. In the rare autopsies performed, the intestinal mucosa presents no lesions characteristic of intestinal amoebiasis and the authors believe that amoebae play only a saprophytic rôle like the flagellates so frequently met with. These parasites may very possibly have been the causal agents of the first attack of diarrhoea. To bring the patient to the condition of sprue more general and profound causes come into play and one of these is, in the authors' opinion, renal insufficiency. As to treatment, calomel, ipecac and emetine are of little use. It is preferable to inhibit the growth of secondary bacteria and remove helminths. Thymol and Betanaphthol in small daily doses (1 gm. per day on the average) are useful for the latter. To inhibit bacterial development, some preparation of lactic ferments is indicated. Gastro-intestinal dyspepsia should be treated by opotherapeutic preparations, such as gastric or enteric extract. If examination of the stools reveals pancreatic insufficiency, prescribe pancreatic extract. When renal insufficiency is present, the patient should be placed on salt-free diet. Light baths for the abdomen are also of value. If there is a tendency to oedema, emetin must be employed with prudence, and accompanied by medication directed to raising the blood pressure. Emetin lowers blood pressure and may consequently favour the production of oedema in persons predisposed thereto.

J. C. G. L.

BERIBERI.

KENNEDY (J. C.). **Beriberi in Lebong. An Account of the Steps taken to eradicate the Disease during 1914.**—*Jl. R. Army Med. Corps.* 1915. Sept. Vol. 25. No. 3. pp. 268–285. With 2 charts.

This report is a model in its way of an investigation into the epidemiology of a form of beriberi occurring locally in a military station. At Lebong there were in 1911 forty-six cases, in 1912 twenty-six, in 1913 sixty-three; in 1914, owing to the preventive measures taken, the incidence was reduced to four. Very early in the enquiry it was recognised that the cases were true beriberi, that the disease was not due to any bacterial or protozoal organisms, and that the food of the troops was dangerously lacking in vitamine content. Recommendations for a fixed dietary with supervision of the cooking had been laid down, and the appointment of an officer to supervise the whole food question; for this Major Kennedy was selected. A detailed account of the four cases which occurred in 1914 is given; all belonged to one company which was housed furthest away in the cantonment. These huts were found to be overcrowded and less hygienic than the others. The men had to travel a greater distance to obtain food between parades, etc., which had a depressing effect, predisposing to the disease. With regard to the dietary, the meat ration was found to be inferior and often badly cooked; supplementary articles of food were insufficient and difficult to get. The dietary was increased by voluntary methods and *every* man was given a substantial evening meal. It was noted that there was a regular loss of weight amongst the men during the rainy season (July to August), which was associated with digestive disorders, and that often physical exercise carried out in excess under these conditions predisposed to the development of beriberi. From the vomit of a beriberi patient two non-lactose fermenting organisms were isolated, one being *B. faecalis alkaligenes*, which agglutinated up to 1/20 with the patient's serum. Previous observers have noted a disease in dogs bearing some resemblance to beriberi; for this the author found the causal organism to be a small streptococcus and the disease was cured by a course of mercurial treatment.

The author concludes that the disease at Lebong was true beriberi, that it was not infectious nor contagious, that it was eradicated by improvement in the dietary and attention to the general health, hygenic surroundings and physical exercise, and that climate, climatic disease (diarrhoea) and badly regulated physical exercise predisposed to beriberi.

The Government has since sanctioned the issue of extra articles of diet recommended and the result will be interesting to note in future reports from this station.

P. W. Bassett-Smith.

CAJAZEIRA (Jose Antonio). **Polynevrite palustre e Beriberi.** [Malarial Polyneuritis and Beriberi.] [With summary in German.]—*Arch. Brasil. de Med.* 1915. June–July. Vol. 5. Nos. 6–7. pp. 252–265.

From his own observations and the researches of others in the country the author draws the following conclusions.—No true form

of malarial polyneuritis exists, as stated in books and generally believed by Brazilian medical men to be found in the towns of Itacoatiara, Manaos or Corumba (Matto Grosso).

He was never able, after the examination of hundreds of cases, to prove that the polyneuritis was malarial, for it appeared to be entirely dependant on alcoholism, or the dietary of the people. He was convinced that a local form of beriberi was present depending entirely on the food, and another form originating in something unknown, which cases ran frequently a rapid and fatal course. The military authorities in Brazil recommend for the troops—

(1) A food ration rich in vegetables and fruit, and excluding polished rice ;
(2) Avoidance of all sedentary punishments for prisoners ;
(3) Isolation at once of all cases of beriberi as soon as it is diagnosed.

P. W. B-S.

Williams (R. R.) & Saleeby (N. M.). **Experimental Treatment of Human Beriberi with Constituents of Rice Polishings.**—*Philippine Jl. Sci.* Sect. B. Trop. Med. 1915. Mar. Vol. 10. No. 2. pp. 99–119. With 2 plates.

In the treatment of beriberi, extracts of rice polishings have been distinctly beneficial in the infantile form but have given disappointing results with adults. The authors felt that a further effort was required to obtain a more widely useful remedy. Allantoin, a substance found in rice polishings, having given good results with fowls and in one case of infantile beriberi was experimented with. This can be synthetically prepared by the oxidation of uric acid with potassium permanganate, could be cheaply made, and its purity easily controlled. Ten cases of beriberi were treated with this substance by the authors and others ; the details of each case are given. Hydrolyzed and unhydrolyzed extracts of rice polishings were used in 17 cases and are also fully described. From these experimental cases they drew the following conclusions.

" Allantoin has a beneficial effect in certain cases of beriberi, although probably never amounting to a complete cure. Its value should be tested further.

" Hydrolyzed extract of rice polishings has benefited all the types of beriberi upon which it has been tried. It can be of practical service, but should be used only in cases under the direct supervision of physicians and nurses.

" Unhydrolyzed extract of rice polishings is a safe and valuable remedy for infantile beriberi, but is of little use for older cases."

Though the vitamine of rice polishings possesses specific and prompt curative properties, its cost at present prevents its general use among the poor. The observations show that all cases of so-called beriberi result primarily from a poor diet deficient in vitamine, and that all the neuritis prevalent among the Filipinos, except certain definite cases due to other known causes, may safely be regarded as beriberi.

Two radiograms are given of a case of beriberi, showing the decrease in the cardiac shadow brought about by the use of vitamine obtained from 25 kilograms of rice polishings.

P. W. B-S.

Albert (J.). **The Treatment of Infantile Beriberi with the Extract Tiqui-Tiqui.**—*Philippine Jl. Sci.* Sect. B. Trop. Med. 1915. Jan. Vol. 10. No. 1. pp. 81–85.

In infantile beriberi the mortality among breast fed infants is greater than among those artificially fed, which is directly contradictory to what is found generally in other conditions. Hirota considered that the disease was a true intoxication produced by the ingestion of beriberi milk and that to cure the disease it was necessary to discontinue the maternal feeding. In the Philippines among the poor this is impossible, as satisfactory artificial foods are difficult to supply. Bréaudat and others have shown that rice polishings (tiqui-tiqui) and mongo given to the mother will bring about cure. The tiqui-tiqui is however very disagreeable to take and breast feeding has to be discontinued for a time. Chamberlain and Vedder found the extract of tiqui-tiqui curative for polyneuritis gallinarum and recommended its use for infants ; 5 cc. of the extract represents 82 grains of rice polishings and the dose advised is 5 cc. of the extract daily, given in 20 drop doses every two hours. The author has employed this method since 1912 and he states that it is of immense value in the treatment of the disease, being better than any known drug. The Philippine legislature in 1914 passed a bill providing money for the preparation and free distribution of the extract to the poorer classes. Sufficient time has not passed to give a definite report but the results have been very favourable. If given early it is followed at once by marked improvement ; at the end of twenty-four hours the vomiting, restlessness, dysphagia, etc. all disappear as if by magic, and at the end of three days the disease is practically cured. If the case is severe, double doses should be given, but the extract must be continued as long as any aphonia remains. Beyond producing a little diarrhoea the extract is entirely uninjurious. Failures are due to (1) extreme severity of the case and too advanced a neuritis ; (2) the disease being complicated with broncho-pneumonia ; (3) improperly prepared extracts. The curative action is due to the supply of active nutritive elements, probably vitamines, which are deficient in beriberi milk. The extract is a vago-tropic drug, having a selective and specific action upon the vagus nerve, and supplying it with its much needed vitamines. If, as in severe cases, the neuritic degeneration has advanced far, no good effect is possible.

P. W. B-S.

Schaumann (H.). **Neuere Ergebnisse de Beriberiforschung.** [Recent Results of Beriberi Investigation.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1915. Aug. Vol. 19. No. 15. pp. 394–418 ; No. 16. pp. 425–445.

The author gives a summary of our present knowledge of the subject of beriberi. The greater part of the paper relates to the etiology ; he describes the three theories, infection, intoxication and dietary defects. The resumé of the results of the dietary experiments in man and animals is very full, but it contains no new work. There is a long list of the recent literature appended.

P. W. B-S.

Tadaharu Maruyama. **Changes in the Heart in Beriberi.**—*Trans. XIIIth Internat. Cong. Med.* Lond. 1913. Sect. III. Pt. 2. Gen. Path. & Path. Anat. pp. 81–86.

The author summarised the knowledge that had accumulated up to 1913 on the pathological findings in beriberi. He divides the paper into two parts, one dealing with the changes in the heart, the second with the nerve and muscle changes ; the work done in his own county by Yamagiwa, Nagayo, and Oyata, being more particularly noted. He however disagrees with Nagayo, who asserts that the change in the muscles correspond to that in the nerves and is in direct proportion to it, his own observations on man and animals showing no such parallelism. The cause of the nerve and muscular degeneration is probably some poison of the existence of which, as he states, there is as yet no positive proof—the view held by most Japanese clinicians and pathologists.

P. W. B–S.

Ottow (W. M.). **Keuring, bewaring en behandeling van zilvervliesrijst (Bras pitjah koelit.)** [Examination, Preservation and Treatment of the Silver Skin of Rice.] [With summary in English.]—*Geneesk. Tijdschr. v. Ned. Ind.* 1915. Vol. 55. No. 2. pp. 75-131.

This long investigation on the curative power of the coverings of the rice grain, particularly the so-called silver skin, contains much experimental work. It is summarised in English under the following headings :—(1) The taste of unpolished rice, which is able to protect against beriberi, is not objectionable. (2) Compared with polished rice unpolished rice becomes easily and rapidly unfit for consumption. With ordinary care it cannot be kept longer than two months without perceptable alterations. (3) The preservation of this unpolished rice is best accomplished by the use of chloroform or carbon tetrachloride ; these can be used in the form of vapour and comparatively small quantities are sufficient ; they do not reduce the anti-beriberi properties of the rice. (4) The fixed amount of ·4 per cent. P_2O_5 is not sufficient to be relied upon when testing the rice. (5) A better method consists in the estimation of the spirit-dry residue according to a process fully described. This dry residue limit has been fixed between 0·55 per cent. and 0·6 per cent. (6) The physiological test with test animals is the only one that gives accurate results ; the use of rice-birds in every respect deserves recommendation. (7) It is quite certain that requirements for an adequate activity of rice are quite worthless if certain stipulations are not made as to the treatment of the rice before it is consumed, namely in the washing and steaming processes.

P. W. B-S.

Ohler (W. Richard). **Experimental Polyneuritis. Effects of Exclusive Diet of Wheat Flour in the Form of Ordinary Bread, on Fowls.**—*Jl Med. Research.* 1914. Nov. Vol. 31. No. 2. [Whole No. 147]. pp. 239–246.

A variety of neuritis or endemic beriberi is prevalent in Newfoundland and on the coast of Labrador, which has been ascribed by Dr. Little

to the restricted diet on which the natives live, consisting mostly of highly milled wheat flour. A series of experiments was, therefore, carried out to observe the effects of an exclusive diet of wheat flour in the form of ordinary white bread. Thirty-one fowls were used, divided into groups in accordance with the exact method of feeding. From the result of these experiments the author established the following facts :—(1) An exclusive diet of white bread, whether with or without yeast, produces in fowls a definite polyneuritis ; (2) If fed on an exclusive diet of whole wheat bread, the fowls remain perfectly well (5 fowls for 75 days). Fowls fed on hominy, made from the inside of the corn kernel, suffered like the ones fed on white wheat meal.

These results are in accord with the experiments reported by Wellman and Bass, when feeding fowls on various food stuffs, including sago, boiled white potatoes, corn starch, wheat flour, rice, etc. [this *Bulletin*, Vol. 2 p. 608], and they support the view of Little that a restricted diet consisting largely of white bread is an important factor, if not the actual cause of beriberi in North Newfoundland and Labrador.

P. W. B–S.

Williams (R. R.) & Crowell (B. C.). **The Thymus Gland in Beriberi.**—*Philippine Jl. Sci.* Sect. B. Trop. Med. 1915. Mar. Vol. 10, No. 2. pp. 121–125.

A diminution in size of the thymus gland has been noticed to occur in pigeons, suffering from polyneuritis and fed exclusively on white rice. Funk proposed a theory that the vitamines of the food have a close relationship to the glands of internal secretion. The authors therefore carried out a number of experiments on fowls and man to see if administration of the thymus gland preparations had any curative effect. From these they conclude that (1) there is no apparent fundamental connection between beriberi and the atrophy of the thymus ; (2) When the latter occurs in birds fed on polished rice it is due to some other cause ; (3) The thymus contains no extraordinary amount of vitamine and the protective effect of administrating the tissue is probably largely due to the purine and pyrimidine derivatives ; (4) The presence of a comparatively large amount of thymus gland in young animals does not appear to be responsible for their modified susceptibility to beriberi.

P. W. B–S.

MALARIA.

GILL (Clifford A.). **Report on Malaria in the Punjab. With Special Reference to its Prevalence amongst School Children.**—28+ xiv. pp. With a map. 1915. Lahore: Supt. Govt. Printing, Punjab. [Price Rs. 2. 8. 0.]

The object of the inquiry, of which this publication forms the report, was to obtain information whether the spleen census of children inhabiting a large number of localities distributed through a Province like the Punjab afforded a reliable index of the distribution of malaria.

In the Punjab the investigations of CHRISTOPHERS showed that malaria prevailed in the autumn of 1908 to a serious and unusual extent throughout every district situated in the plains. In certain areas, termed by him "epidemic areas," the disease was well-nigh universal and caused a mortality of several hundreds per mille. In all the epidemic areas examined *shortly after* the epidemic the spleen-rate in children was exceedingly high, a rate of 50–90 per cent. being not uncommon.

The years 1909–1912 were marked by a steady decline in fever mortality and, so far as is known, a decrease in the prevalence of enlargement of the spleen amongst children. During 1909–1913 the autumnal fever mortality in the Punjab has been lower than that of any previous quinquennium since 1868.

In reviewing the question of the value of the spleen-rate in the measurement of malaria the author calls attention to the remarks made by Surgeon-Major DEMPSTER in 1847 which, in view of what we know at the present time of the etiology of malaria, serve to prove that this acute observer deserves to rank with BUCHANAN, ROSS, ROGERS, JAMES, CHRISTOPHERS and BENTLEY, who have done so much to bring about our present state of knowledge of malaria in India.

Surgeon-Major DEMPSTER wrote:—

"(1). The spleen-test forms an accurate method of estimating the salubrity of different malarious localities.

"(2). Great variations in the spleen-rate may be found in localities in close proximity to one another.

"(3). Young persons are more liable to the disease than adults, and the spleen test in the former is the more delicate test of malaria.

"(4). The degree of the enlargement of the spleen is most probably indicative of the intensity of the remote cause of the disease.

"(5). Marsh malaria is frequently less prevalent in large cities with high walls and smoky streets than in villages."

These main points enumerated by DEMPSTER have become a matter of common knowledge during recent years and, as the author remarks, it is difficult to realise that they were made in the absence of knowledge regarding the mode of transmission of malaria by anopheline mosquitoes.

As regards the method of carrying out the spleen census two principles were laid down:—

1. The medical examination of children for enlargement of the spleen must in all cases be conducted by a medical officer of not lower rank than a Sub-Assistant Surgeon.

2. The procedure must be so arranged that uniformity is ensured in regard to the class and number of children examined, the method of examination and the recording of results.

The result of the inquiry has been to establish that by means of the spleen census of school children it is possible to obtain reliable information regarding the endemiology of malaria. The number of children examined in each locality was in most cases sufficient, while in large towns the measurement of the spleen rate of one or two schools yielded the same result as that produced by examining the children of all the schools. Another result of this investigation is to emphasise the manner in which malaria is subject to spontaneous variations of great magnitude in this Province, a spleen rate of 80 per cent. having become reduced to one of 1 per cent. in a period of six years. This fact therefore suggests the expediency of carrying out a periodical spleen census at least once a year. It is estimated that for a sum of less than Rs. 1,500 per annum a spleen census, sufficiently complete for all practical purposes, could be carried out without difficulty in all parts of the Punjab. It is believed that the above amount would suffice to obtain precise information of great value regarding the incidence of malaria throughout the Province and that this information, which furnishes the only reliable basis for the study of malaria over large areas, cannot be obtained within a reasonable period in any other way. It is thought that with minor modifications to suit local conditions the scheme could be readily adopted for a similar purpose in other malarious tracts of India or other countries. Though in some localities the spleen rate has fallen from 80 per cent. to 1 per cent., in others there has been no such reduction. It is therefore important to determine the local conditions under which (*a*) great reductions in endemic malaria occur under natural conditions, (*b*) the spleen rate tends to become reduced at a slower rate and to a smaller degree. The importance of carrying out such an inquiry cannot be exaggerated for, in view of the natural tendency to the disappearance of malaria, it seems not impossible that a study of the conditions associated with this phenomenon would lead to the discovery of the means whereby the efforts of nature could be assisted so as to lead to the complete abolition of the disease in these areas.

C. M. Wenyon.

WALKER (Ernest Linwood). **The Transmission of Malaria in the Philippine Islands.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Oct. Vol. 3. No. 4. pp. 222–227.

This paper is really a condensed account of the paper by the author and BARBER which was reviewed in this *Bulletin*, Vol. 5, pp. 337–9. The author again emphasises the necessity of complete information on the anopheline fauna of any region, the importance of knowing the kind of breeding places selected by the different species, and the necessity of determining experimentally the relative ability of the different species to transmit malaria. The subsequent investigations of BARBER (this *Bulletin*, Vol. 6, p. 325) showed that in the Philippine, malaria was always associated with *Anopheles febrifer* and that along the coast and in the regions devoted to the cultivation of rice, where *A. rossii* breeds abundantly, there was no malaria unless there were also shaded brooks and *Anopheles febrifer*.

In the discussion following the reading of the author's paper a question of synonymy was raised by Dr. C. S. LUDLOW, who explained

the origin of the name *A. febrifer*. Dr. Ludlow first identified the mosquito as *A. funestus* Giles. Specimens of this mosquito were sent to Mr. F. W. Edwards of the British Museum, who identified it as *A. christophersi* Theobald. Meanwhile, however, Dr. Ludlow had renamed it *Myzomyia flavirostris*. Mr. Banks also in August 1914 renamed this species as *A. febrifer* so that the synonomy of the species becomes according to Ludlow*:

Anopheles (*Myzomyia*) *christophersi* Theobald.
alboapicalis Theobald.
mangyana Banks.
funesta Ludlow *non* Giles.
febrifer Banks.

C. M. W.

i. Dible (J. Henry). **The Transmission of Malaria in Northern France.** —*Lancet.* 1915. Sept. 25. pp. 701–702; and *Jl. R. Army Med. Corps.* 1915. Nov. Vol. 25. No. 5. pp. 577–579.

ii. Reid (J. McG. H.) & Humphrys (H. E.). **Malaria contracted in Flanders.**—*Brit. Med. Jl.* 1915. Oct. 23. p. 603.

i The paper records two cases of benign tertian malarial infection in two members of the British Expeditionary Force in French Flanders. In neither case had a journey abroad been previously taken, so that both must have been infected in France. It is interesting to note that one of the two men was stationed in a district which had previously been occupied by Indian troops, amongst whom recrudescent cases of malaria are comparatively common. It is evident therefore that infected mosquitoes now exist in France, in an area, moreover, which was previously free from the disease.

ii A record of six cases of benign tertian malarial infection, which appears to have originated in Flanders owing to the individuals having been stationed near Indian troops or troops returned from abroad. One of the cases reported is of special interest as the patient claims to have had his first attack in England after being stationed at Portsmouth and Bulford. After being in France one month the second shivering attack occurred and then similar attacks occurred daily for some time till the condition was diagnosed by blood examination.

C. M. W.

Clark (H. C.). **The Diagnostic Value of the Placental Blood Film in Aestivo-Autumnal Malaria.**—*Jl. Experim. Med.* 1915. Oct. 1. Vol. 22. No. 4. pp. 427–444. With 1 plate.

The investigations recorded in this paper were carried out at the Board of Health Laboratories at Ancon with a view to testing the value of examination of placental blood for evidence of malarial infection. At the end of labour some blood films were made from the peripheral blood of the mother by the physician in charge and these with the placenta were sent to the laboratories for examination. On arrival at the laboratories the cord was carefully cleared: it was cut across and films were made from the foetal blood. Films were also made from the maternal aspect of the placenta after removal of clots.

*See also this *Bulletin*, Vol. 6, p. 338 and note.

In this way it was possible to make a comparative examination of the peripheral blood of mother and foetus and the placental blood. In all 400 cases were thus examined, with the result that the placental blood showed infection in 19 cases, the maternal peripheral blood in 8 cases, and the blood from the cord in one case only. The placental films revealed malaria in 11 cases where peripheral blood was negative, while on the other hand the peripheral blood was never found positive without the placental film showing a much heavier infection.

Amongst the 400 cases there were 44 accidents (abortion, still birth, premature labour) and of these cases 7 were infected with aestivo-autumnal malaria. The total number of aestivo-autumnal infections amongst the 400 cases was 19, while of another 5 direct evidence of recent malarial treatment was obtained.

In most cases the first field of the placental blood film examined gave evidence of infection and in some cases this was so heavy that a fatal issue seemed certain for both mother and child, yet in all cases the mother lived and in nearly all cases the child also. In most cases of heavy infection of placental blood the peripheral blood of the mother only revealed parasites after tedious search. The commonest types of parasite found in the placental blood are the segmenting and presegmenting forms. Crescents were seldom found.

As regards the foetal blood only a single instance occurred in this series where an undoubted moderate infection existed at the time of birth. The mother's blood and the placenta bore evidence of a very heavy infection and there was a history of associated accident of pregnancy in relation to the placenta, so that it seems wise to attribute the infection to the placental accident. The observations bear out the view that under normal conditions the maternal and foetal bloods never come in contact with one another. It often seems incredible that a foetus can live where nutrition is derived from such heavily infected placental blood, yet in a remarkable number of cases (negroes at least) they do survive. In the words of the author "the placenta is one malarial battle-field over which the body holds the ruling influence, for by expulsion of the uterine contents the field and its contained enemies are quickly eliminated."

The paper is illustrated by a plate showing the types of parasite encountered in this investigation.

C. M. W.

Jamison (S. Chaille). **Malarial Anaemia.**—*Southern Med. Jl.* 1915. Sept. Vol. 8. No. 9. pp. 758–760.

After an ordinary acute attack of malaria the anaemia which exists is of the secondary type, the red blood corpuscles and haemoglobin being reduced in equal proportions. After chronic malaria of some years' standing the picture is that of typical pernicious anaemia with high haemoglobin index, poikilocytosis, nucleated red cells and others seen in this type of anaemia. Patients may show this type of anaemia and have no malarial parasites in the blood on account of their having taken quinine continuously. If quinine is not taken for three weeks, the real nature of such cases is revealed by the appearance of parasites in the peripheral circulation.

In certain acute cases of malaria there is extreme anaemia both of the red cells and haemoglobin, with the absence of poikilocytosis, anisocytosis, polychromatophilia, and erythroblasts. These cases might be classed under acute aplastic anaemia.

C. M. W.

Billings (F.) & Post (W. E.). **Fatal Malaria due to the Tertian Parasite.**—*Trans. Chicago Path. Soc.* 1915. Mar. 1. Vol. 9. No. 6. pp. 209–215. With 4 text-figs.

The paper describes a severe and fatal attack of cerebral malaria in a man 50 years of age, due exclusively to heavy infection with the parasite of benign tertian malaria. The blood when drawn for counting had a peculiar chocolate brown colouration, while sections of the tissues showed thrombi of parasites in the cerebral vessels and many plasmodia distributed in the capillaries of all the tissues examined.

C. M. W.

Heard (Wm. Haughton). **Case of Malarial Fever with Motor Paralysis of the Legs.**—*Jl. Trop. Med. & Hyg.* 1915. Dec. 1. Vol. 18. No. 23. pp. 271–272.

The case described is one of mental dullness combined with motor paralysis of the legs in a native government porter in British East Africa. Blood examination showed sub-tertian malaria (crescents and rings) though the usual symptoms of such infection were absent. The patient quickly recovered under quinine treatment so that the author feels justified in describing it as a type of malarial infection of an unusual nature.

C. M. W.

Salm (A. J.). **Een geval van Malariapsychose.** [A Case of Malarial Insanity.]—*Geneesk. Tijdschr. v. Ned. Ind.* 1915. Vol. 55. No. 4. pp. 466–473.

A case of delusional mania occurring in a European soldier, who was found upon admission to hospital to be suffering from fever with tertian parasites in the blood. The fever was treated with quinine, and simultaneously the mental symptoms subsided, so that the author thinks that the two were in the relation of cause and effect. [The case lasted for about 10 weeks, namely from August 11th to October 23rd 1912, which is so very much in accordance with the usual duration of an attack of delusional mania, that it is perhaps possible that the relation was only one of coincidence. The mental symptoms seem to have been of a very ordinary character, having commenced with a threatened assault upon an unoffending person, followed by fear of robbery, refusal to eat, taciturnity and bodily restlessness, and finally complete amnesia, which passed off upon convalescence.]

J. B. Nias.

da Matta (Alfredo A.). **Nevrite optica no decurso de meningite determinada por febre perniciosa palustre. (Nota clinica.)** [Optic Neuritis due to Meningitis arising in the Course of Pernicious Malarial Fever.]—*Arch. Brasil. de Med.* 1915. Aug. Vol. 5. No. 8. pp. 320–322.

Brief notes of a case of pernicious malarial fever in a boy aged 16, who was treated energetically with quinine in doses varying from 1 to 2½ grammes daily, administered hypodermically. Microgametocytes of *Laverania malariae* were found in the blood. The patient recovered perfectly after 13 days of illness, but for 5 days during the course of the illness there was temporary amaurosis. As the pupils were not dilated and reacted to light, the author attributes this symptom, not to the quinine, but to a meningitis due to the parasite. J. B. N.

Bossellini (P. L.). **Distrofia aplasica ungueale malarica (solchi trasversali o di Beau).** [Transverse Furrowing of the Nails (Beau's sulci) in Malaria.]—*Giorn. Ital. d. Malat. Ven. e d. Pelle.* 1915. July 7. Vol. 56. Ann. 50. No. 3. pp. 255–266. With 1 plate and 2 text-figs.

A case of pronounced furrowing of the nails after a three weeks' attack of tertian ague, which was treated with quinine. A good illustration of the condition, which affected all the fingers of both hands, is given. The author points out that the lesion is essentially due to a temporary arrest of growth in that part of the nail which is developed from the Malpighian layer of the ungual sulcus, while the growth of the layer which develops from the bed of the nail is continued without interruption. A useful list of recent memoirs on the subject is appended. J. B. N.

MacGilchrist (A. C.). **The Relative Therapeutic Value in Malaria of the Cinchona Alkaloids—Quinine, Cinchonine, Quinidine, Cinchonidine and Quinoidine, and the Two Derivatives—Hydro-Quinine and Ethyl-Hydro-Cupreine. (Cinchona Derivatives Inquiry. Fifth Communication).**—*Indian Jl. Med. Research.* 1915. July. Vol. 3. No. 1. pp. 1–89. With 149 charts.

This is a long paper which records the results of investigations undertaken to test the value of certain alkaloids in the treatment of malaria. The author has already tested their toxicity on guinea pigs and their lethal action on infusoria with the result that if one takes the action of quinine as a standard the following conclusions can be drawn :—

"(1) Ethyl-hydro-cupreine is less harmful to guinea-pigs and more lethal to infusoria.

"(2) Hydroquinine is less harmful to guinea-pigs and equally lethal to infusoria.

"(3) Cinchonidine is less harmful to guinea-pigs but much less lethal to infusoria.

"(4) Cinchonine is somewhat more harmful to guinea-pigs but distinctly more lethal to infusoria.

"(5) Quinidine is more harmful to guinea-pigs and not quite so lethal to infusoria except in great dilution (1 in 100,000), and

"(6) Quinoidine is much more harmful to guinea-pigs and much less lethal to infusoria."

These results suggest that ethyl-hydro-cupreine and cinchonine might prove superior to quinine in anti-malarial power; that hydroquinine might substitute quinine; that quinidine might be useful and that cinchonidine and quinoidine would prove of little value—particularly quinoidine on account of its toxicity to mammals. The present paper has to do with the clinical application of these results.

The test was carried out in two large jails at Alipore—the Presidency Jail and Alipore Central Jail.

Quinine, quinidine, cinchonine, and cinchonidine were administered in the form of the sulphate; ethyl-hydro-cupreine and hydroquinine in the form of the hydrochloride; and quinoidine was dissolved in a little rectified spirits and diluted with glycerine. All were given in solution and exclusively by the mouth. A dose was given every eight hours and the amount administered was directly in proportion to the man's weight, a precaution which does not appear to have been followed in previous tests of this kind. A blood film was made every eight hours, at the time of administration of the drug, and the disappearance of the parasites noted. A further precaution taken was the preparation of the patient for absorption of the drug by the administration of a dose of calomel immediately after admission.

The total number of malarial cases tested was 149 as shown in the following table:—

TABLE III.

	Total experimental cases.	Benign tertian infection.	Malignant tertian infection.	Quartan.
September ..	14	5	9	0
October ..	39	27	11	1
November ..	60	30	28	2
December ..	36	11	21	4
	149	73	69	7

Of this number 71 had enlargement of the spleen. The experiment was conducted in three series.

In the first series 72 cases were treated with one of the four alkaloids —quinine, quinidine, cinchonine and cinchonidine—in the form of sulphate obtained from the Government factory at Mungpoo near Darjeeling. The dosage was at the rate of 1 gram per 70 kilos of body weight. The chief point to be noted was that in every case and in all types of malaria nine doses of the four alkaloids were sufficient to cause the disappearance of the asexual forms of parasite, and that even in the case of benign tertian infection in some cases it required the full nine doses to bring about this result.

The second series of experiments was undertaken with a view to determining the minimal effective dose of quinine in the three types of malarial infection. The drug was given to a series of patients, each successive patient receiving a smaller and smaller dose, till a dose was reached which failed to cause the disappearance of the parasites from the peripheral blood. By determining the minimal effective dose of quinine it would be simple, by giving the other alkaloids in the same dosage, to determine their therapeutic value relative to that of quinine.

The result of the second series showed that the minimal effective dose of quinine was ·1 gram per 70 kilos of body weight for the benig tertian parasite, ·15 gram for the malignant and ·2 gram for the quartan parasite.

The third series of experiments was undertaken on 61 cases. The dosage used was that obtained as a result of the second series and in addition to the drugs used in the first series there were also employed quinoidine, hydroquinine and ethyl-hydro-cupreine. The results obtained are shown in a series of tables which must be consulted for details of the observations. The drug was administered every eight hours and continued while the patient remained in hospital. The time of disappearance of the asexual forms of the parasite was noted. The results of the first and third series of experiments are illustrated in Table XXXIII, which is reproduced here.

TABLE XXXIII.

A.

Average total amount of alkaloid in grammes per 70 kilo. administered before asexual parasites disappeared from the peripheral blood.

	Large Doses. (First Series.)			Small Doses. (Third Series.)		
	Benign Tertian.	Malignant Tertian.	Quartan.	Benign Tertian.	Malignant Tertian.	Quartan.
Quinine ..	4·7	6·1	9	·74	1·16	..
Cinchonine ..	5·5	5·6	9	·8	1·03	..
Quinidine ..	5·0	*4·85	..	* ·92	1·32	..
Cinchonidine	5·6	*4·3	..	..	..	..
Hydroquinine	..	..	..	·65	·88	*1·97
Ethyl-hydro-cupreine	..	..	..	* ·66	1·78	*2·5
Quinoidine ..	..	..	..	1·08	2·5	*1·6

B.

Average number of doses required before asexual parasites disappeared from the peripheral blood.

	Large Doses (First Series.)			Small Doses (Third Series.)		
	Benign Tertian.	Maligiuant Tertian.	Quartan.	Benign Tertian.	Malignant Tertian.	Quartan.
Quinine ..	$4\frac{2}{3}$	$6\frac{1}{3}$	9	$7\frac{1}{2}$	$8\frac{1}{7}$	..
Cinchonine ..	$5\frac{2}{13}$	$5\frac{3}{4}$	9	8	7	..
Quinidine ..	$5\frac{1}{4}$	*5	..	*9	9	..
Cinchonidine	$5\frac{3}{4}$	*$4\frac{1}{3}$	..	..	..	..
Hydroquinine	..	..	..	$6\frac{2}{5}$	$5\frac{5}{6}$	*$10\frac{1}{2}$
Ethyl-hydro-cupreine ..	..	..	..	*$6\frac{1}{2}$	$12\frac{1}{3}$	*13
Quinoidine ..	..	..	..	$10\frac{3}{4}$	$16\frac{2}{3}$	*8

* See note at foot of Table C.

C.

Average number of hours before asexual parasites disappeared from the peripheral blood.

	Large Doses (First Series.)			Small Doses (Third Series.)		
	Benign Tertian.	Malignant Tertian.	Quartan.	Benign Tertian.	Malignant Tertian.	Quartan.
Quinine ..	37	49	72	60	65	..
Cinchonine ..	45	46	72	64	56	..
Quinidine ..	42	*39	..	*72	72	..
Cinchonidine	46	*35	..	..	..	..
Hydroquinine	..	..	..	51	47	*84
Ethyl-hydro-cupreine ..	..	..	..	*52	98	*10
Quinoidine ..	..	..	..	86	133	* 6

*" The figures marked with an asterisk are based on very few experiments and so are not so reliable as the others."

The relative therapeutic value of the alkaloids is determined from the figures in the small dose columns in the table. It will be noted that hydroquinine gave far the best results both in benign and malignant tertian infections ; that cinchonine, quinine, and quinidine come next ; ethyl-hydro-cupreine gave very disappointing results, while quinoidine was least effective of all. A calculation made from the table gives the following quantities of drug per 70 kilos of body weight required to rid the body of the asexual forms of the benign tertian and malignant parasites :—

Hydroquinine	·765 gram.
Cinchonine	·915 „
Quinine	·95 „
Quinidine	1·12 „
Ethyl-hydro-cupreine	1·22 „
Quinoidine	1·79 „

The cases of quartan infection were so few that definite conclusions are not justified.

The relative frequency of by-effects such as nausea, cinchonism, etc., is discussed. Quinine and quinidine affect the ears more than do any other alkaloid, cinchonine coming next ; vision is affected chiefly by quinine and cinchonine, while the latter is liable to cause diarrhoea if continued in large doses for more than a week. Even in large doses cinchonidine caused no unpleasant by-effects. In large doses quinidine was the most nauseating, cinchonine and quinine coming next.

It is noted that of the 149 patients under experiment seven had no fever throughout the period : five of these were benign tertian infections and two malignant. These afebrile malarial patients are " carriers " of malarial infection. Hyperpyrexia is not peculiar to any special variety of parasite, but is most frequent in sub-tertian infections. Typical tertian infection temperature charts, i.e., charts showing fever on alternate days, are few in number and are quite as frequent in malignant as benign infections.

In benign tertian and quartan infections sporulating forms become very rare after two or three doses of medicine. The time that elapses between defervescence or disappearance of fever and disappearance of asexual parasites from the peripheral blood varies from nil to three or even four days.

A case is mentioned of a Punjabi who was admitted to hospital with a malignant tertian infection. No treatment was given and the patient recovered in five days, an illustration that "spontaneous cure" occurs sometimes and may introduce a slight error into experiments of the kind described in this paper.

Observations were made upon patients who had crescents in the blood. Only large doses of drug were employed. It resulted that the order of effectiveness of the alkaloids was much the same as that against the asexual parasites, hydroquinine being the best. The experiments also show that the alkaloids are able to check crescent formation. If therefore the treatment be continued during the natural life span of a crescent—it is said to be about three weeks—crescents will disappear from the blood.

Relapses occurred in 8 per cent. of the cases treated. They varied with the different alkaloids, but here again hydroquinine, cinchonine and quinine gave the best results.

As regards the hydroquinine used in the experiments the author explains that it is a derivative of quinine prepared synthetically by Zimmer & Co., Frankfort-on-Main; it is a reduced product, its molecule containing two atoms of hydrogen more than that of quinine, the additional hydrogen being linked to the vinyl side-chain of quinine, the vinyl becoming thereby an ethyl group. The price charged by Zimmer & Co. was four shillings and ninepence an ounce. It exists naturally in small quantity in Cinchona bark and is contained in the mother liquor from which quinine sulphate crystallises as well as in commercial sulphate, sometimes to 4 per cent. It differs from quinine in only very slowly decolourising a solution of potassium permanganate. Heated with strong hydrochloric acid at 140° C. it loses a methyl group and is converted into hydro-cupreine.

The Cinchona Febrifuge of the Mungpoo Factory was found by Waters to be equal to quinine weight for weight. This mixture contains 48·81 per cent. of quinine, quinidine and cinchonine. The Residual Alkaloid of the same factory contains a higher percentage of these three alkaloids, namely, 58 per cent. These alkaloids being the principal active agents, the Residual Alkaloid should be more potent than the Cinchona Febrifuge.

Certain improvements in the manufacture of Cinchona derivatives are indicated:—

"1. To obtain a bark containing as little quinoidine as possible.

"2. To extract quinine for use as such and for the manufacture of hydroquinine.

"3. To issue the remaining alkaloids as residual alkaloid, which should contain as little quinoidine as possible but have a high percentage of quinine, cinchonine and quinidine combined."

The long and interesting paper concludes with a series of temperature charts of the cases subjected to the experimental tests.

C. M. W.

Boyd (Hugh). **The Administration of Quinine in Malaria.**—*Southern Med. Jl.* 1915. Sept. Vol. 8. No. 9. pp. 753–758.

On account of its solubility and the rapidity of its absorption the bimuriate of quinine is the best preparation to use when a quick effect is desired and it is to be used intramuscularly and intravenously to the exclusion of all other salts. It can often be given to patients in whom the sulphate produces urticaria. The hydrobromide and ethyl carbonate will often act well on patients in whom the sulphate produces gastro-intestinal or nervous symptoms. Quinine should always be given to children in solution. The best preparation is probably the ethyl carbonate in simple syrup in doses of $\frac{1}{2}$ to 3 grains. The tannate is also quite tasteless and can be given in chocolate confections or syrup.

The author gives it as his experience that when the capsules are not absorbed it is best not to trust quinine in the stomach but to give it intramuscularly. The strength should never be greater than $\frac{1}{3}$ gram to 10 cc. of water. The author uses 5 grains of bimuriate of quinine dissolved in 3 drams of boiling water. Quinine may be given by the rectum. The bimuriate is found in the urine 30 to 35 minutes after being given per rectum in dilute solutions.

The author writes very emphatically against the single large doses of quinine. If a patient is seen a few hours before a paroxysm 6 to 8 grains are given at once followed by 3 grains every three hours or 4 grains every four hours. In some cases, if the stomach will tolerate it, 10 to 12 grains are given at once, 5 grains two hours later followed by the smaller doses at three or four hour intervals. The quinine should be kept up in this manner for 40 to 70 hours after fever has subsided, when the dose can be halved for several days and then 10 grains given every other day for two or three months with a dose of 15 grains instead of 10 once a week. Cases of malaria which demand more than 30 grains of quinine in 24 hours and a larger initial dose than 10 grains are very rare.

In chronic malaria 16 to 24 grains of quinine are given every sixth and seventh day for two and a half to four months, always giving 3 to 5 grain doses every 3 to 4 hours.

In pernicious malaria the author resorts to oral administration if he can, to the intramuscular injections if he must, and often to both. In these pernicious cases it is necessary to give quite a large initial dose, 10 to 15 grains intramuscularly, and to repeat by half every 6 to 10 hours as required. The author states quite definitely that in the treatment of haemoglobinuric fever quinine has no place. A few cases occur without the previous administration of quinine but most of them follow it.

C. M. W.

Holst (M. K. T.). **Symposium: Malarial Fever, its Prevention and Cure.**—*Med. Missions in India.* 1915. Oct. Vol. 21. No. 83. pp. 129–136.

The paper contains remarks on the treatment of malarial fever by Drs. Holst (Mardan), Turner (Bandawe, Nyasaland), Prentice

(Kasungu, Nyasaland) and Carr (Inuvil, Ceylon). All write of having employed the subcutaneous or intramuscular method of quinine administration with advantage.

C. M. W.

Stott (Hugh). **Tetanus and Hypodermic Quinine.** [Correspondence.] —*Indian Med. Gaz.* 1915. Nov. Vol. 50. No. 11. pp. 433.

In the form of a letter to the Editor the writer replies to the criticism of Lieut.-Colonel Henry Smith and Major Clayton Lane, who raise the question of tetanus resulting from injections of quinine as an argument against this method of its administration. The writer claims that no such infection can arise unless there is some fault in technique and even the formation of a painful node is regarded in his practice as evidence of some defect in the method of injection.

C. M. W.

Lyons (Randolph). **The Failure of Intravenous Mercuric Chlorid in the Treatment of Malaria.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Oct. Vol. 3. No. 4. pp. 243–245.

This paper records the results of a trial of the method of treatment of malaria by intravenous injections of mercuric chloride, as advocated by Barlow [this *Bulletin*, Vol. 6, p. 335]. Three cases of aestivo-autumnal infections were selected and it was found that injections of bichloride of mercury are not efficient and are far inferior to quinine. The type of infection selected for experiment gives a fairer test of the real value of any specific medication than the simple tertian form, which is easily influenced by extrinsic factors.

C. M. W.

Vendenhoff. **Neosalvarsanbehandlung bei 15 Fällen von Malaria tertiana.** [Treatment by Neosalvarsan in 15 Cases of Benign Tertian.]—*München Med. Woch.* 1915. Oct. 26. Vol. 62. No. 43. pp. 1456–1457. With 6 curves.

The author has treated fifteen cases of benign tertian malaria occurring in Russian prisoners in Germany by means of intravenous injections of neosalvarsan. In each case the dose was ·6 gram in pure distilled water. The injections were made shortly before the onset of fever and in all cases the next fever attack did not occur. Of the fifteen cases treated eight had no relapse. In four of the cases of relapse after three to twenty-four days parasites reappeared in the blood at the time of recurrence of fever. Three cases relapsed after a second injection, which necessitated the administration of a larger dose of ·9 gram of the drug.

Neosalvarsan has the advantage of acting more quickly than quinine and can be used in those cases in which quinine has no action. The author mentions a case of quartan infection seen by him in 1914 on the line of the Bagdad railway, which was treated with two injections of neosalvarsan (·6 and ·9 gram) without any good result, though the subsequent administration of quinine effected a cure.

C. M. W.

Ziemann (H.). **Ueber eigenartige Malariaparasitenformen.** [Special Forms of Malarial Parasites.]—*Cent. f. Bakt.* 1. Abt. Orig. 1915. July. Vol. 76. No. 5. pp. 384–391. With 1 plate.

The author gives a list of the characters which distinguish the two varieties of the malignant malarial parasites which he recognises. The one, *Plasmodium praecox* (Grassi and Feletti), syn. *P. immaculatum*, *P. falciparum*, is the type common in Italy and most tropical countries; the other, *Plasmodium perniciosum*, is of West African origin. The first is distinguished from the second by :—

1. Small quantity of pigment.
2. Higher colour of pigment.
3. Complete disappearance from the peripheral blood after segmenting stage is reached.
4. Want of " brassy tint " of infected cells.
5. Schizonts occupy only $\frac{1}{3}$–$\frac{1}{2}$ diameter of red cell and merozoites are few (12–16).
6. Less inclination to crescent production.
7. Crescents when produced are smaller and plumper.
8. The free spheres (gametocytes) of this form resemble those of the ordinary benign tertian parasite but are only $\frac{1}{2}$–$\frac{1}{3}$ the size of these.

For practical purposes the recognition of the two varieties of the malignant parasite is of little value.

Mention is made of two cases seen by the author in Cameroon, in which the parasites were remarkable in the extraordinary development of the chromatin. As these were only seen twice in thousands of examinations and as in these cases there were other factors at work, the author concludes that they were accidental variations of the usual form. The examination of films from Formosa convinces the author that here also is to be found the type which he describes as *Plasmodium perniciosum*.

The peculiar forms of malignant parasite described by Balfour in the Third Report of the Wellcome Research Laboratories in Khartoum are next considered and he is of opinion that insufficient data for a correct diagnosis are available. In reference to the " so-called *Plasmodium tenue* of Stephens " he points out that it appears to resemble Balfour's Khartoum parasite, a resemblance which the describer of *P. tenue* has overlooked. Here again he considers the data insufficient and cannot accept *P. tenue* as a good species.

[The author is apparently unaware of the paper by Balfour and Wenyon on these parasites [this *Bulletin*, Vol. 5, p. 53] and that Laveran first used the specific name for a parasite of a Japanese bird, which is the true *P. tenue*.]

The *Plasmodium vivax* var. *minuta* described by Emin is next considered. It was discovered in the blood of pilgrims on Camaran Island in the Red Sea. The peculiar features of this parasite, as given by Emin, are :—

1. Very active amoeboid movements.
2. No enlargement or paling of the red cell.
3. Occurrence of Schüffner's dots which may take on the form of filaments.

4. Commencement of nuclear division when the parasite is only half the size of the red cell.
5. Schizogony in the peripheral blood with 4–10 merozoites. The schizont is only $\frac{2}{3}$ the size of the red cell.
6. Only slight pigment development even at the end of growth. The pigment with the greater part of the cytoplasm remains as a residual body.
7. The gametocytes are round and attain a size of $\frac{3}{4}$ that of the red cell.

Owing to the kindness of MARCHOUX the author has been able to examine some of EMIN's films and he comes to the conclusion that the parasite is not merely a variety, as EMIN thought, but a good species and he gives it the name *Plasmodium camaranense.* He mentions several further distinguishing features of this parasite. The chromatin is well marked even in young forms and may be twice the amount usual in malignant parasites. In ring forms the chromatin is often within the ring and it early splits into two or three separate parts. Not infrequently it is seen in the form of rods, hooks or rings as in the form described by STEPHENS. Nuclear division is generally clearly marked when the parasite is only 1/4–1/3 the diameter of the red cell.

The cytoplasm is in the ring form only in the youngest stages. It then assumes a rather remarkable irregularity of shape and form. In older forms, which never reach more than 4/5 the cell diameter, it is often difficult to see a clear outline in 50 per cent. Multiple infection of red cells is common. There do not appear to be ever more than 12 merozoites. The pigment is very fine, even in half-grown forms, but when nuclear division has commenced it becomes more evident as there appear one or more dark brown granules. In the infected cell no true Schüffner's dots are seen, at any rate as they occur in the case of benign tertian infections and in deeply stained quartan infected blood. On the other hand there occur the rods and filaments which are more like Maurer's dots and are undoubtedly the markings described by EMIN as Schüffner's dots. The red cells, as EMIN stated, are not enlarged. The female gametocytes can be distinguished from the male by the deeper colour and more peripheral nucleus.

C. M. W.

SWELLENGREBEL (N. H.). **Over de schizogonie van de Quartana-parasiet** (*Plasmodium malariae*). [The Schizogony of the Quartan Parasite.] [With German summary.]—*Geneesk. Tijdsch. v. Ned. Ind.* Vol. 55. No. 1. pp. 1–9. With 1 plate.

This paper, which is illustrated by a coloured plate, describes two types of schizogony of the quartan malarial parasite, one of which appears to commence in a parasite showing all the features of a male gametocyte and the other those of a female. Whether this has to do with a parthenogenesis and etheogenesis the author is not prepared to state. In both of these the chromatin can be distinguished as two distinct substances, the one staining a deep red and the other a pale red. The latter often serves as a ground substance or support for the former.

C. M. W.

Biglieri (R.). **Ueber spontane Hämagglutination bei Malaria.**—*Wien. Klin. Woch.* 1915. Sept. 30. Vol. 28. No. 39. p. 1054.

The author, writing from Tucuman in the Argentine, has examined 600 cases of malaria for auto-agglutination of the red blood corpuscles, a phenomenon which is common in trypanosome infections. A positive result was obtained in 158 cases. Of the benign tertian cases examined 55 per cent. were positive, of the quartan 55 per cent. and of the subtertian 63 per cent. No such auto-agglutination was observed in cases of tuberculosis or enteric, but occasionally it is noted in puerperal septicaemia and pregnancy.

C. M. W.

Cole (James Clifton). **Malaria and Carriers of Malarial Infection.**—*New Orleans Med. & Surg. Jl.* 1915. Nov. Vol. 68. No. 5. pp. 311–314.

The author discusses the question of malaria prevention from the three points of view: Malaria, Mosquito and Man. He shows that, though scientific sanitation has done much and is destined to do much more, mosquitoes are here for many years to come and man for always, and that one should direct one's energies and attention towards man, especially the chronically infected and potential carrier. He does not advocate the discontinuance of the war upon the anopheles: they are pests apart from being carriers of disease, but the campaign against them means the outlay of enormous sums of money and expenditure of time, all of which is of little avail. The author's advice is to diagnose the case of malaria, disinfect the blood of every probable carrier, isolate and treat known cases and in a few years malaria will be a rare infection, even in the presence of anophelines. [The author probably has in mind a community with a large white element.]

C. M. W.

Carter (Henry R.). **Memoranda from Malarial Surveys and Demonstration Work.**—*Southern Med. Jl.* 1915. Sept. Vol. 8. No. 9. pp. 750–753.

The author draws attention to the use of sawdust as a material for filling holes which may become breeding places for mosquitoes. In the neighbourhood of sawmill villages, where there is abundance of sawdust, its use for this purpose affords the cheapest and most effective means of carrying out this work.

He finds that anti-malarial campaigns are much more easily carried out in industrial communities, in which the bulk of the population is engaged in a few large industries, than in the ordinary commercial town with diversified occupations and interests.

C. M. W.

Henão M. (E.). **Ferrocarril de Antioquia. Departamento Medico. Informes sobre Sanidad.** 1915. 46 pp. With 2 plans.

A report from the medical superintendent of the sanitary department of the Antioquia Railway, Colombia, containing recommendations for the improvement of the sanitary conditions at various important

stations on the line. Full prominence is given to the prevention of malaria amongst the employees by means of a systematic distribution of quinine, along with the drainage and petrolisation of all pools and other collections of standing water in the vicinity of the line. The chart at the end of the report shows very clearly the satisfactory result of such measures at the important station of Cisneros. From a monthly sickness rate, from malaria alone among the employees of approximately 11 per cent. in the years 1910 and 1911, the figure had fallen to zero by the middle of the present year, 1915.

J. B. N.

Messore (Luigi). **Relazioni della campagna antimalarica nel territorio di Marcianise nell' anno 1913.**—*Malariologia.* 1915. Oct. 15. Vol. 8. No. 5. pp. 119–129. With 1 map.

The district of Marcianise (province of Campania, Italy) presents a special difficulty with regard to the prevention of malaria from the existence of large numbers of tanks in which hemp is steeped during the summer months for the preparation of the fibre. During the process of steeping the water becomes too foul for the breeding of Anopheles, but in the early part of the season these receptacles form pits for rain water. The problem of dealing with these pits, and also with the migratory labourers who come to work at the preparation of hemp in their immediate neighbourhood, is discussed in the present paper.

J. B. N.

Malariologia. 1915. Aug. 15. Vol. 8. No. 4. pp. 73–115. With 1 plate.

This number of *Malariologia* is entirely given up to a collection of funeral addresses and other expressions of esteem and regret, which were uttered upon the occasion of the death of Professor Angelo Celli in November, 1914. Professor Celli was buried at Frascati, near Rome, on a site overlooking the Roman Campagna, which was one of the principal scenes of his labours.

J. B. N.

BLACKWATER FEVER.

Stephens (J. W. W.). **Studies in Blackwater Fever. IV.—Note on a Case of Quartan Malaria associated with Blackwater Fever.**—*Ann. Trop. Med. & Parasit.* 1915. July 31. Vol. 9. No. 3. pp. 429–433. With 1 chart.

A case of blackwater fever in a European who had resided for four years in West Africa. Three days before the onset of the blackwater he was admitted to hospital for fever, and showed a scanty quartan infection. The rise in temperature at the time of onset of the symptoms of blackwater corresponded to the time of the next paroxysm due to the quartan parasite. No malarial parasites were found after the onset of symptoms of blackwater. Malarial pigment was found in the organs at the post-mortem examination.

C. M. Wenyon.

Burkitt (R. W.). **Blackwater Fever.**—*Lancet.* 1915. Nov. 20. pp. 1138–1140.

The author gives it as his experience that the urine in blackwater fever cases is highly acid and contains acetone, indicating a diminished alkalinity of the blood. On this account he has treated his cases in British East Africa with blood alkalinisers—calcium chloride and potassium or sodium bicarbonate. The results have been very good; in some cases there have been remarkable recoveries and in others, where blackwater fever has seemed to be imminent, the administration of the alkalies has warded off an attack.

Patients may recover from the blackwater and still harbour malarial parasites in spite of quinine treatment. These quinine resistant parasites should be destroyed by an intravenous injection of neo-salvarsan, as advocated by the late Prof. Ehrlich.

When the blood is in a condition of acid poisoning, the administration of quinine may act as "the last straw" and bring on an attack of blackwater, whereas if the acid is neutralised first by administration of alkali, quinine or neo-salvarsan can be administered without danger. In one case mentioned the administration of neo-salvarsan without the preliminary neutralisation of the blood by alkali brought on an attack of blackwater.

C. M. W.

Forsyth (Charles E. P.) & Jameson (Ernest T.). **Blackwater Fever: Notes on Three Consecutive Cases.**—*Indian Med. Gaz.* 1915. Nov. Vol. 50. No. 11. pp. 416–417.

The paper records three cases of blackwater fever in Europeans. In one case the person attacked had only been in India eight months. During convalescence malarial parasites were found in all three cases, two having benign tertian infections and one subtertian. All had taken quinine very irregularly before the attacks and in one case an excessive dose of quinine seems to have caused the onset. During

the convalescence of the patient who had been in India only eight months there developed a very severe subtertian infection, which was only brought under control by repeated hypodermic injections of quinine. The authors mention five other cases of blackwater fever treated by them in Indians of the educated class and record the observation of Dr. West of Bishnauth of a case of the disease in a native coolie.

C. M. W.

Lahille (Abel). **Deux Cas de fièvre bilieuse hémoglobinurique observés en Cochinchine.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1915. Nov. 4. 3 ser. Vol. 31. No. 31–32. pp. 905–917.

A description of two cases of haemoglobinuric fever in Cochin China. One case was fatal and the other recovered. In both cases a detailed account is given of the treatment and of the results of examination of the blood and urine. It may be noted that in the severe case there was a great variation in the composition of the blood from time to time. The chlorides may be 3·27 grams per litre of blood and the urea 5·77 grams; the hydraemia may be extreme with 145 grams of serum to 35 grams of clot; the albumin varied from 82·7 grams per litre of serum on the day before death to 78·9 grams four days earlier. The injection of iso- or hypertonic saline solutions intravenously or subcutaneously did not seem to alter the chlorides in the serum, though in the benign case a temporary rise was effected by this treatment.

These observations do not support the view that a deficiency of the mineral element in the blood is a cause of the disease. The quantity of bile pigment in the blood was in direct proportion to the severity of the case.

C. M. W.

Salóm (C. E.). **Prehemoglobinuria febril. (Apreciaciones Clinicas)** [Febrile Pre-Haemoglobinuria.]—*Gaceta Med. de Caracas.* 1915. Sept. 15. Vol. 22. No. 17. pp. 134–136.

By the above name the author would distinguish a febrile condition intermediate between ordinary malaria and true blackwater fever, which is characterised by rigors, bilious vomiting, albuminuria, pain in the back and jaundice. This condition, which in the opinion of the author amounts to a distinct pathological entity, is to be met with in various malarial districts of Venezuela. It occurs only in persons who have been subject to malarial attacks and are exposed in addition either to chill, or to alcoholic excess, or to venereal excess, or any other depressing agent which may be supposed to influence the nervous system. A slow extension of the malarial poison to the sympathetic nervous system may be supposed to affect the vaso-motor control to such an extent that the various phenomena constituting the condition may arise. The term "Icteroideta" having been coined by Professor Machado for yellow fever, the author thinks that the complex of symptoms which he describes may be suitably termed "Icteroideta paludica."

J. B. Nias.

Bijon (Raymond). **Étude expérimentale chez l'homme de l'influence de la quinine dans la pathogénie de la fièvre bilieuse hémoglobinurique.**—*Bull. Soc. Path. Exot.* 1915. Oct. Vol. 8. No. 8. pp. 597–604.

As a result of investigations conducted on two cases of haemoglobinuric fever the author makes the following deductions :—

1. There is a diminution of the resistance of the red blood corpuscles and there exists a lysin in the blood (autolysin).
2. The lysin comes into action owing to a failure of the body to produce the necessary anti-lysin.
3. Quinine has an action on the lysin either by saturating it or perhaps indirectly by destroying malarial parasites.
4. Quinine cannot have any effect on the progress of haemoglobinuric fever but only on its etiology, by accidentally precipitating the onset in an individual who is already in a state of malarial intoxication and will almost certainly have an attack later even without the administration of any quinine.

C. M. W.

Gasbarrini (A.). **Studî sulla malaria. (VII)—Contributo allo studio dell' emoglobinuria da chinino nella malaria.** [Contribution to the Study of Quinine Haemoglobinuria in Malaria.]—*Malaria e Malat. d. Paesi Caldi.* 1915. May–June. Vol. 6. No. 3. pp. 115–130.

A study of a case of haemoglobinuria in a patient the subject of tertian ague. The symptoms came on after taking a gramme of quinine. The patient recovered after a stay of two months in hospital, during which time his blood was repeatedly tested for autolysins by the methods of De Blasi and Donath and Landsteiner, the results being shown in a table. The presence of autolysins could be constantly demonstrated in the red cells, but not in the serum. Donath and Landsteiner's test only gave a positive result when the serum was mixed with an equal quantity of salt solution containing 0·02 per cent. of hydrochloride of quinine. For further details reference should be made to the original paper.

J. B. N.

TYPHOID AND PARATYPHOID IN THE TROPICS.*

HARVEY (D.). **The Causation and Prevention of Enteric Fever in Military Service, with Special Reference to the Importance of the Carrier. Being an Account of Work done at Naini Tal Enteric Depot, 1908-1911.**—*Jl. R. Army Med. Corps.* 1915. June. Vol. 24. No. 6. pp. 491–508; July. Vol. 25. No. 1. pp. 94–120; Aug. No. 2. pp. 193–214.

Col. Harvey holds that "all cases of enteric fever (and under this term are included the paratyphoid fevers) in military service are caused by contact with infected persons, either direct or indirect"; i.e., taking "carrier" to mean all infected persons or bacillary excreters, by carriers. In civilian life he is prepared to admit the operation of other causes, but in military life in India he believes the importance of the carrier to be supreme. This he supports by numerous instances where carriers have undoubtedly been the source not only of small explosive epidemics but also of endemic incidence over considerable periods of time. Flies, whether faecal bred or as mechanical transmitters, he regards as of comparatively little importance. The essence of prevention, therefore, is the unearthing and care of carriers.

This has been rendered possible by the effects of inoculation, to which he is convinced that the decline in the enteric in the Indian Army is largely due. No doubt there have been changes for the better in sanitation, but he maintains that these have been in no way radical and cannot fairly be held to account for the great fall in typhoid incidence. Paratyphoid, against which typhoid inoculation is no protection, has not fallen in consequence of the changes. They may be held to account for the fall in the cholera-rate which took place in the 1891–1900 period as compared with the 1862–1870 period, but the enteric rate actually rose in the later period to double what it had been in the earlier. The cause lay not so much in defective sanitation as in the prevalence of the carrier.

In 1906 investigation was begun at Meerut, at first by the examination of healthy men for carriers, and later (since this involved enormous labour for very small result) by the examination of cases during their convalescence. This showed that of 86 men, 10 (or 11·6 per cent.) passed typhoid bacilli for over six months after defervescence, though only two developed into true chronic carriers. In consequence it was decided to establish depots, to which all convalescents from enteric should be despatched and regularly examined, and where they might be detained for three months, or longer if they remained infective. The procedure naturally varied as time went on, and there were various extrinsic hindrances to a complete routine, but each man, at all events later, was examined daily for a week on arrival and again for two weeks before leaving the depot. Carriers who become chronic usually excrete persistently in the earlier months, though they may later intermit, and the week's examination at first was a useful test, allowing few carriers to escape notice. Details are given of the methods of examination, and tests were made on the opsonic, bactericidal &c. powers of the sera in many cases.

*Many of the summaries in this Section are not really covered by the title; it is thought useful at the present time to publish them.

Quite frequently these examinations yielded bacilli which behaved like paratyphoid A on lactose, mannite, glucose, saccharose, milk and absence of indole, and were agglutinated by high titre serum, yet did not absorb the agglutinins out of the serum, and were therefore not regarded as being true paratyphoid A. Similar organisms resembling typhoid were met with, and it was rare for a day to pass without encountering one of these "simulating" bacilli.

As the result of some experiments on the point it was found that when urine containing many bacilli was passed on to soil (either in the dark or exposed to light and sun) the bacilli could not be recovered after 30 hours. In faeces passed into dry earth, the bacilli were recoverable from the surface up to the 5th day, and from the centre of the mass till the 14th day. When faeces were smeared on blankets, the bacilli also died rapidly, though this depended on the temperature, in cold weather typhoid being still recovered after one month. On towelling the bacilli in urine were recoverable for 10 days or more. The author considers that in the presence of other organisms, especially *B. coli*, under conditions where these can multiply (as in soil or faecal contamination, in warm weather) typhoid and paratyphoid bacilli die out quickly; but where such conditions are absent (as in urine contamination or at low temperatures) they may survive for a considerable period.

The following observation is of importance in view of the method at present strongly advocated of diagnosis by repeated examination of the serum. "A study of the Widal reactions in over 100 cases" [of paratyphoid A fever] "has shown that in the early days of the fever the agglutinins are not present, but as a rule the group reaction for *B. typhosus* begins before the specific reaction for *B. paratyphosus* A. This group reaction for the *B. typhosus* may reach as high a titre as that obtained in an attack of true enteric fever. The reaction for paratyphoid is, as a rule, lower, and may only be demonstrated in such dilution as 1 : 20 or 1 : 40. . . . . [It] is frequently transient and may only be present for a few days in the later stages of the fever."

Col. Harvey maintains very strongly and justly the military importance of thorough examination of convalescents not only in typhoid but in paratyphoid, and hopes that by systematic procedure the incidence of the latter in India may be reduced as much as typhoid has been. [The paper was written in 1911–1912, and much of what is published here has been justified by recent experience and is of great value at the present time.]

J. Henderson Smith.

FAICHNIE (N.). **The Recent Decline of Enterica amongst British Troops in India.**—*Jl. State Med.* 1915. Sept. Vol. 23. No. 9. pp. 262–271; Oct. No. 10. pp. 296–305.

Enterica, under which name is included paratyphoid fever with typhoid, has been diminishing in the Indian Army since 1908, and while the decline has been steady for India as a whole, in individual stations the manner in which it begins is sometimes striking. Thus in Ambala, the rate which had for 20 years up to 1905 been 30 per cent. suddenly fell to 5 and has remained so; in Mhow with a similar former

rate it fell in 1908 to 4, and has stayed there. It was not till 1909 that inoculation had been carried out on a scale extensive enough to affect general statistics. The decline can hardly be attributed to improved water-supplies, or precautions against milk, dust or the other usually assigned causes of the disease. But the author " is strongly of opinion that the isolation of " carriers " has had very little to do with it." The importance of the carrier amongst the troops in India has, he thinks, been greatly exaggerated, as the carrier fails to explain the salient characters of enterica as it occurs in that country, and should give rise to characteristics which are not in fact met with. Nor does he admit that direct transference by flies can be of fundamental importance. He does, however, incriminate the fly in another way. The fly in this view deposits in human faeces eggs, which in due course hatch out into larvae. These larvae become intestinally infected with the organisms prevalent in the material in which they hatch, and the same contents are met with in the adult fly developed. The faecal bred fly then deposits its excrement or vomit in barracks or other situations whence man can be infected, and thus if the faeces in which the eggs were laid were infected with typhoid, cases are caused of enterica. The experimental finding that typhoid bacilli cannot be recovered from adult flies fed on typhoid material after 24 hours is explained on the assumption that the adult fly has an already established flora, which kills out the intruding typhoid under these conditions, whereas in the faecal bred fly the original flora contains (or may contain) typhoid and will continue to do so. Enterica therefore will be present where opportunity occurs for faecal bred flies to carry their infection. If the trenches where night-soil is buried are (1) far from the barracks, or (2) so constructed or treated that fly-eggs cannot hatch out, then infection should not occur ; and Col. Faichnie quotes a number of instances (as at Mhow) where improved trenching was accompanied by an immediate drop in the enteric incidence. He urges as an immediate reform that the shallow 12-inch trench should be forthwith abandoned.

J. H. S.

Snijders (E. P.). **Over de epidemiologie van de Febris Typhoidea, naar aanleiding van waarnemingen in Deli.** [Observations on the Epidemiology of Typhoid in Deli.] [With summary in German.] —*Geneesk. Tijdschr. v. Ned. Ind.* 1915. Vol. 55. No. 4. pp. 393–420.

It is frequently said that in any outbreak of typhoid fever there is a large number of cases which pass unrecognised or are only diagnosed by very thorough examination. But the proportion that such mild cases bear to clinically recognisable cases is a matter of uncertainty, and no doubt varies in different places. Typhoid may be said to be endemic in Deli, the death rate per 10,000 population having been 30 from 1897–1904, and 14 from 1905–1912. There seemed to be a chance of ascertaining here whether mild cases were at all frequent, since it is usual to have the stools, blood and urine examined in any doubtful case of even slight diarrhoea, through fear of cholera, dysentery or typhoid itself. Out of about 1,700 bacteriological examinations in the year 1914, 94 gave a positive finding of typhoid

bacilli; and in all but six of these the disease had been suspected or tentatively diagnosed on clinical grounds. In one of the six there was also a dysentery due to amoebae and in another the predominant symptom was pyelonephritis. In this endemic area, then, there was nothing to suggest that mild or unrecognised cases, or at all events such cases with diarrhoeic symptoms, were at all frequent. The post-mortem examinations during the year agreed with this. Out of 81 autopsies four were due to enteric, and 3 were recognised before death (the fourth being in a Javanese who died before full examination was made). One or two carriers were found, but the distribution of the cases in the district did not suggest that they were largely due to such a cause. The writer gives an historical account of the progress of epidemiological theories of the spread of typhoid. J. H. S.

Jennissen (J. A. M. J.). **Een typhusendemie in de Raya-vallei te Billiton.** [An Outbreak of Enteric Fever in the Raya Valley at Billiton.]—*Geneesk. Tijdschr. v. Ned. Ind.* 1915. Vol. 55. No. 1. pp. 10–25. With diagram; No. 5. pp. 487–509. With 12 charts.

An account of an outbreak of enteric amongst a body of 1,500 Chinese coolies employed at the Billiton tin-mines. The cause was traced to the bathing of men in a pool of water contaminated with human excreta. The author points out that as enteric fever is very common in China, typhoid-carriers are always to be expected amongst emigrating Chinese. The account is chiefly interesting for the wholesale vaccination of the body of coolies implicated, with typhoid vaccine supplied by the Pasteur Institute at Weltevreden. The usual result of a great reduction in the severity of the disease amongst the completely vaccinated was observed, 33 cases with one death occurring amongst the vaccinated and 249 with 41 deaths amongst the non-vaccinated [the total number in each class is not stated]. Other hygienic measures of the usual kind, such as the provision of a fresh water supply, were taken in addition, and the supervention of the rainy season with its flushing of the soil finally brought the trouble to an end.

The second portion contains clinical notes on various features of interest in the epidemic, from which it appears that enteric fever runs very much the same course, as regards complications, in a Chinaman as it does in a European. Out of a total of 267 cases of the disease, 107 were selected for treatment with a therapeutic vaccine, prepared according to Chantemesse's directions at the Pasteur Institute at Weltevreden, but without any apparent advantage. The mortality among these 107 patients amounted to 12, or 11·2 per cent., while among the whole 267 there were 27 deaths, or 10·5 per cent. This decidedly low mortality is attributed by the author, probably quite correctly, to the early detection of the cases, and their immediate removal to hospital. J. B. Nias.

Winckel (Ch.). **Paratyphus A in Nederlandsch-Indië.** [With summary in German.]—*Geneesk. Tijdschr. v. Ned. Ind.* 1915. Vol. 55. No. 1. pp. 35–54.

Out of 48 cases of suspected enteric bacteriologically examined by the author at Batavia during the months of September, October and

November 1914, 10 proved to be paratyphoid A (Brion-Kaijser), 1 *B. coli* and 37 true *B. typhosus*. The author thinks this percentage of paratyphoid unexpectedly large. He puts forward the suggestion that typhoid vaccine for use in the Dutch Indies should always be a mixed vaccine, containing paratyphoid A. Paratyphoid B was not observed.

J. B. N.

Snijders (E. P.). **Over de vraag der Typhus-verbreiding door vliegen en stof.** [The Spreading of Enteric by Flies and Dust.] [With summary in German.]—*Geneesk. Tijdschr. v. Ned. Ind.* 1915. Vol. 55. No. 1. pp. 55–63.

A critical discussion of the question indicated by the title, chiefly directed against the views of Messerschmidt [*Centralblatt für Bakteriologie*, 1 Abt. Orig. 1914, Vol. 74, p. 1]. As might be expected from a writer in a tropical country, the view is taken that flies and dust, along with typhoid-carriers, play quite as prominent a part in the dissemination of typhoid as the contamination of water-supplies.

J. B. N.

Gaide. **Note sur la frequence de la fièvre typhoide dans le Nord-Annam.**—*Bull. Soc. Med. Chirurg. Indochine.* 1915. July. Vol. 6. No. 7. pp. 234–238.

In North Annam in the years 1909–1914 22 cases of typhoid with 13 deaths have occurred in Europeans and 79 with 17 deaths in natives, and there were, no doubt, many others which were unrecognised either because of their mild character or because of errors in diagnosis.

J. H. S.

Scott (Harold). **An Investigation into the Causes of the Prevalence of Enteric Fever in Kingston, Jamaica; with Special Reference to the Question of Unrecognised Carriers.**—*Ann. Trop. Med. & Parasit.* 1915. June 30. Vol. 9. No. 2. pp. 239–284. With 10 charts.

From an analysis of the notifications of disease in Kingston during the last 10 years Scott finds that the average number of enteric notifications per month presents a curve, which, lowest in January and February, rises steadily to a maximum of nearly 35 in June, falls again to under 20 by August, and remains about the same for the rest of the year, with a secondary slight rise in November. In no month is it less than 15, and even when allowance is made for the inaccuracy of notification records this is a large number for a town of 60,000 inhabitants with the natural advantages of climate and situation possessed by Kingston. The water supply is good and regularly tested; but every opportunity is given for the spread of infection by the other recognised routes owing to the absence of a water-carriage system in a large part of the area and the habits of the population. Scott set himself to examine the bile in every autopsy that came under his care with the object of gaining therefrom some idea of the prevalence

of carriers in the general population, and he here gives the result of the examination in 200 cases. Twenty-eight of these presented macroscopic evidence of enteric, although in six the disease had not been diagnosed during life, and from 25, including one paratyphoid A, the organism was isolated from the bile. In six other cases which died from other causes, presented no evidence of enteric post mortem and gave no history of enteric at any time, *B. typhosus* was obtained, and in at least two of these there was no evidence of cholecystitis. It would scarcely be justifiable to conclude from evidence of this sort, or from so small a series of cases, that 3 per cent. of the population were carriers, but it is enough to show that there must be carriers enough to maintain the disease in Kingston under the prevailing sanitary conditions.

J. H. S.

Bayma (Theodoro). **A Typho-Vaccina em S. Paulo. Segunda nota.** [Anti-Typhoid Inoculation at St. Paulo. Second Note.]—*Ann. Paulistas de Med. e Cirurg.* 1915. Vol. 5. Nos. 2–4. 7 pp.

The second portion only of a paper of which the first does not seem to have come to hand, and which it is consequently not possible to summarise very satisfactorily. In the course of an epidemic of enteric fever at San Paulo, Brazil, about 11,000 persons, of whom a large proportion were public officials or the inmates of public institutions, were vaccinated with anti-typhoid vaccine. As the total population of the city of S. Paulo amounts to 500,000, this number is only $2\frac{1}{4}$ per cent. of the whole. The result seems to have been satisfactory as regards the occurrence of cases amongst the inhabitants of schools and other similar institutions, but naturally the exposure to infection is usually much less in such places from ordinary sanitary precautions, such as the boiling of water and milk, being taken at the same time. The data furnished are therefore not very instructive. The vaccines used were locally prepared according to four different processes, the method of F. Russel proving the most satisfactory.

J. B. N.

von Wilucki. **Bericht über 33 Krankheitsfälle von Paratyphus B an Bord S. M. S. "Posen".** [Report on 33 Cases of Paratyphoid B on Board the "Posen".]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1915. June. Vol. 19. No. 12. pp. 321–336.

A small epidemic occurred on this ship, involving 33 persons. The cases did not occur explosively but irregularly over some time, and presented great variety of symptoms. The water was infected with "paratyphoid-like" bacilli, but genuine Paratyphosus B was isolated from food, and as many as six carriers were found amongst the staff handling food, and also one other in the pantry. A dog was also found to be carrying the bacilli. Large doses of Bolus alba were very effective.

J. H. S.

Torrens (J. A.) & Whittington (T. H.).—**Preliminary Note on the Clinical Aspects and Diagnosis of Paratyphoid Fever.**—*Brit. Med. Jl.* 1915. Nov. 13. pp. 697–703. With 12 charts.

Paratyphoid fever in Western Europe is much more commonly due to the B type of bacillus than the A type. In India, however, the A type has been comparatively common, and in the experience of the writers the A cases have been in troops from India for the most part or in men in close association with them. Clinically the two are indistinguishable, but the A fever is apt to last three or four days longer than the 10–18 days typical of B infections, and is in general rather milder. The temperature in both shows a characteristic disinclination to settle down finally. Cases may present the symptoms of the most severe type of typhoid, but are in general mild, and it is with these milder types, which may resemble a slight influenza, chill or rheumatism that this paper chiefly deals. The onset usually occurs in one of two fashions, either a gradually increasing headache and slight abdominal pain with perhaps some diarrhoea, nothing at first to make the victim see a doctor but slowly developing, or a sudden onset such as occurs often in influenza, where the patient goes to bed quite well and awakens feverish with severe headache, abdominal pain, diarrhoea and perhaps shivering. In 100 cases of B. infection and 50 of A, the onset in 85 per cent. included headache, in 55 per cent. diarrhoea, in 35 per cent. abdominal pain, in 30 per cent. pain in the limbs, 25 per cent. shivering, 25 per cent. extreme general weakness, 25 per cent. backache, and 20 per cent. epistaxis. The headache, usually vertical, is the predominant symptom and is voluntarily mentioned by 80 per cent. of the patients. The initial diarrhoea is slight and gives place in a week to constipation, and the early repeated shivering is very noticeable, especially in A infections. Epistaxis is rarely marked. Cough, vomiting, dizziness are often seen. The temperature may rise to its maximum in 48 hours, but the writers did not see very many early cases.

By the second or third week the symptoms in the average case are of this character.—The aspect is dull, the patient is rousable but heavy and lethargic, headache and backache are complained of. The temperature varies from 99·2° to 102·4°, producing a characteristic spiky chart. It is not common (5 per cent.) to have a continuous high fever; 104° was reached in only 12 per cent. The pulse is slow, even more than in typhoid, and variable in its slowness in the same patient; it is soft and compressible. About 15 per cent. of cases show dicrotism, and when present it is almost pathognomonic of an enteric group infection. Spots occur in 75 per cent. of cases at one time or another, and in 20 per cent. are present after the temperature has reached normal. They are larger, more regular and of a deeper red than in typhoid, and usually fairly definite. In A cases the rash tends to be very profuse. The spleen is enlarged and palpable in nearly 60 per cent. of cases, and should always be examined, as it is palpable even in quite mild cases and is readily made out because the abdomen is commonly not distended.

In the third week improvement sets in, and is obvious even though the temperature is still high. Defervescence is usually by modified crisis or short lysis. But the pulse is then the best guide to the

condition of the patient. If it is over 100, it is a bad sign. The complications seen in typhoid may all occur; meteorism and broncho-pneumonia are not so frequent, but haemorrhage is as frequent as in typhoid. Paratyphoid B appears to affect particularly the large gut (caecum, descending colon) and to be very liable to induce pus formation.

Short relapses or returns of fever are fairly common, especially in paratyphoid A (25 per cent.) where they may be associated with rigors. The mortality was a little over 4 per cent. in B infections, and a little under 1 per cent. in A infections.

J. H. S.

Safford (A. H.). **Paratyphoid "A" Fever.**—*Brit. Med. Jl.* 1915. Nov. 13. pp. 713–714. With 2 charts.

A short clinical statement based on 100 cases, agreeing in the main with the preceding account of Torrens and Whittington.

J. H. S.

Robinson (Henry). **Notes on the Clinical Characteristics of Cases treated as Paratyphoid Fever.**—*Lancet.* 1915. Oct. 16. pp. 851–860. With 12 charts.

A clinical study based on 47 cases where paratyphoid organisms were definitely isolated, and a number of others, in which though clinically the diagnosis was almost certain, the organism was not in fact obtained. Stress is laid on the slow, occasionally very slow, pulse, and on the characters and prominence of the roseola.

J. H. S.

Minet (Jean). **Complications de paratyphoidiques (1re note.) Hemorrhagies intestinales.**—*Bull. et Mém. Sec. Méd de Hôpit. de Paris.* 1915. Oct. 21. Vol. 31. 3 ser. No. 29–30. pp. 838–845. With 3 charts.

In 60 cases the author saw three severe haemorrhages, one in an A infection recurring over a period of five days, and two in B infections. None was fatal, though the loss of blood was considerable in all, and only in one was the haemorrhage accompanied by a fall in temperature.

J. H. S.

Coyon (Am.) & Rivet (Lucien). **Etude clinique sur les paratyphoides.** —*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1915. Oct. 21. Vol. 31. 3 ser. Nos. 29–30. pp. 773–785. With 4 charts.

In 96 blood cultures made from suspected cases of enteric the *B. typhosus* was obtained three times, *B. paratyphosus* A 41 times, and *B. paratyphosus* B 10 times. Forty-two cases gave no result on culture, but of these 16 were determined serologically to be infections with A (7 times) and B (9 times). In many of the positive cases the Widal reaction was negative for all three organisms at the time of bleeding, and in others it was negative for both paratyphoids and positive for

typhoid, possibly owing to inoculation. In such cases a later examination often showed an intense positive reaction for one or other organism, and there seemed ground for believing that the agglutination reaction appeared late in paratyphoid infections, later than in typhoid, e.g. in one case Widal reaction was negative on the 18th day for all three, but strongly positive for paratyphoid A on the 23rd day. [This is a common experience.] In 24 cases in which blood culture was positive no agglutination was obtained. [But no indication is given as to when the serum was tested.] Clinically the authors saw only three cases of abrupt onset, and no instance of the true typhoid state. The only unusual feature in their clinical description is the intense sweating they observed in almost all their cases, the patients being bathed in perspiration continually. They had seven relapses, all in A infections.

J. H. S.

Coyon (Am.) & Rivet (Lucien). **Un cas mortel de paratyphoide B. Peritonite à bacilles paratyphiques et colite ulcereuse segmentaire.** —*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1915. Oct. Vol. 31. 3 ser. Nos. 29–30. pp. 786–790. With 1 chart.

There was no perforation, though the bacillus was recovered from the peritoneal fluid, but intense ulceration of the Peyer's patches of the lower end of the small intestine and in particular large lesions in the appendix and caecum and, most of all, in the descending colon where there was extensive ulcerative colitis. [Similar involvement of the large intestine has been described by various writers on paratyphoid cases.]

J. H. S.

Irons (Ernest) & Jordan (Edwin O.). **An Infection with the Paratyphoid Bacillus** (*B. paratyphosus* **B**).—*Jl. Infect. Dis.* 1915. July. Vol. 17. No. 1. pp. 234–240.

In this case an attack of fever, due to paratyphoid B and accompanied by gall-bladder symptoms, left the patient a chronic carrier for over a year with intermittent recurrence of cholecystitis during that time. The gall-bladder was then drained, and the attacks have not recurred for over a year, and during that time no paratyphoid bacilli have been found in the stools, though present in pure culture at the time of operation. A point of special interest is that the patient had three attacks of pain in the region of the gall-bladder in the five weeks before the general infection developed. During the acute attack the organism was isolated from the blood, but it could not be definitely ascertained whether the original cholecystitis was an early manifestation of an infection which later became general, or whether a paratyphoid infection supervened in a patient already suffering from a recurrent cholecystitis. No gall-stones were found at the operation.

J. H. S.

Schmidt (P.). **Ein Fall von intrauteriner Uebertragung von Paratyphus.** [A Case of Intrauterine Transmission of Paratyphoid B.]—*Deut. Med. Woch.* 1915. July 29. Vol. 41. No. 31. pp. 911–912.

Cases of intrauterine infection of the foetus with typhoid have been repeatedly put on record, but this appears to be the first report of a

similar occurrence with *B. paratyphosus* B. The bacilli were isolated from the blood and stools of the mother, and the child was born the day after the blood was drawn. The day after birth blood was taken from the child by scarifying the back and found to contain the organism, though the stools were negative. Blood was again drawn, special attention being given to sterilising the skin, and again found positive, and a skin culture made at the same time (to exclude possible surface contamination) was negative. The child died on the fourth day, without fever and without agglutinins in the blood, and a bilateral pneumonic infiltration with enlarged spleen was found post mortem, *B. paratyphosus* being again isolated from heart, bile, urine and spleen. The invasion was too general at the time of first examination to make infection from the maternal passages at birth a probable explanation, and a transplacental infection seems to have occurred. J. H. S.

Reiter (Hans). **Ueber therapeutische Typhusvakzination.** [Treatment of Typhoid by Vaccines.]—*Deut. Med. Woch.* 1915. Sept. 16. Vol. 41. No. 38. pp. 1120–1123.

The author gave at 3–5 day intervals repeated subcutaneous doses of ordinary prophylactic vaccine [presumably heat-killed] in 67 cases of typhoid fever, and reports favourably on the results, especially on a reduced duration and diminished mortality. But complications are in no way affected, and it is not treatment which invariably produces improvement. J. H. S.

Deutsch (Felix). **Zur Vakzinebehandlung des Typhus abdominalis.** [Treatment of Typhoid by Vaccines.]—*Wien. Klin. Woch.* 1915. July 29. Vol. 28. No. 30. pp. 810–812. With 6 curves.

An unstated number of cases was treated with Besredka vaccine and, unlike the majority of writers on this subject, the author is very sceptical as to any real advantage gained by it. Intravenously he regards it as dangerous, owing to the risk of heart failure, if repeated injections are given (he used a dose of 0·25 to 1 cc.), and after trying intravenous followed by subcutaneous injections, he finally adopted the subcutaneous route (1–4 cc.) for all injections; this was always well borne without marked reaction. In one case after a typical reaction and continued fall of temperature, the patient went down hill steadily and died on the 5th day. Good results were certainly obtained in some cases, but there were very many failures. J. H. S.

Paulicek (Emanuel). **Zur Frage der Typhusheilimpfungen.** [Treatment of Typhoid by Vaccines.]—*Wien. Klin. Woch.* 1915. July 15 Vol. 28. No. 28. pp. 759–763. With 13 charts.

Sixty-eight cases treated intravenously with Vincent's vaccine, 100 millions; the usual effects of rigor and fall of temperature by crisis or rapid lysis. Two deaths from intestinal haemorrhage followed on the injections, and 21 other deaths occurred chiefly from complications. In 37 cases success was immediate, in 18 the temperature took 2–3 days to come down; 8 were quite refractory. J. H. S.

Reibmayr (Hans). **Ueber Impfstoffbehandlung des Typhus abdominalis auf intravenösem Wege.** [Intravenous Vaccine Treatment of Typhoid.]—*München. Med. Woch.* 1915. May 4. Vol. 62. No. 18. pp. 610–612. With 11 Curves.

In 68 enteric cases intravenous injections were made of 0·5–1·2 cc. of an emulsion containing 500 million typhoid bacilli, killed by 1 hour at 53° and suspended in 0·5 per cent. carbolic. In normal individuals this may produce a rise of temperature to about 40°. In typhoid cases there developed a shivering fit in about a half to three-quarters of an hour, which lasted perhaps half an hour and might be accompanied by fluid evacuations, and the temperature rose to 40°, 41° or even 42°. After 5–24 hours the temperature fell rapidly to 37° or even to 35°. The rigor was not accompanied by any increase in the number of bacilli in the blood, and no change in the leucopenia or leucocyte picture developed during it or during the rise of temperature, and the agglutination titre remained steady. It might be to some extent limited in severity by administering a gram of quinine an hour before giving the injection. The improvement in the condition of the patient was undoubted and not confined to the temperature. Even in those cases where the temperature rose again, there was a decided improvement otherwise. Some cases did not react and the writer thinks that those cases which do not respond to a first injection will not do so to any further injections. Of the 68 cases 41 were definitely improved, of whom 14 lost their fever entirely. The remainder did not respond at all.

J. H. S.

Loewy (Robert), Lucksch (Franz) & Wilhelm (Ernst). **Zur Vakzinetherapie des Typhus abdominalis.** [Vaccine Treatment of Typhoid.]—*Wien. Klin. Woch.* 1915. July 15. Vol. 28. No. 28. pp. 756–759. With 2 curves.

Eighty-two cases were treated with Vincent's vaccine (49 subcutaneously, 26 intravenously and 7 in both ways), and 95 with Besredka's vaccine (49 subcutaneously, 21 intravenously and 15 both ways); and the conclusion reached is that the method is a good one. Subcutaneous injection was quite harmless and fairly efficient in reducing temperature, but intravenous was quicker and better, though any cardiac complication is to be held as a complete bar. The dose intravenously should not exceed 125 millions; subcutaneously a first dose of 250 millions can be given, rising to 500 or even 1,000 millions. Besredka's vaccine was found better, and it usually produced a leucocytosis.

J. H. S.

Brach (Cel.) & Froelich (Jos.). **Zur Vakzinebehandlung des Typhus abdominalis.** [Vaccine Treatment of Typhoid.]—*Wien. Klin. Woch.* 1915. June 10. Vol. 28. No. 23. pp. 615–616. With 4 charts.

Sixty cases treated with 500 millions of Vincent vaccine subcutaneously, and later increasing doses if required, on alternate days. There were five deaths from heart failure (possibly accentuated

by the treatment) and in 15 no successful result. In 15 the temperature came down within three days, and stayed down, and in 25 more it was down inside five days. No complications were observed in these cases.

J. H. S.

Szécsy (Eugen). **Die Behandlung des Typhus abdominalis mit Besredka's Vakzine.** [Treatment of Typhoid with Besredka's Vaccine.]—*Deut. Med. Woch.* 1915. Aug. 12. Vol. 41. No. 33. pp. 966–968.

The cases coming under Szecsy's care had all been recently in the trenches, were ill-nourished, many of them wounded, and 11 per cent. with frostbite severe enough to require amputation, and before vaccine was tried he had a mortality of 22 per cent. When he adopted vaccines the mortality fell to 2 per cent., although he made no selection among the cases treated. After trying smaller doses he came to the conclusion that the best results were got with a vaccine not more than 12 days old and containing a half-loop of sensitised bacilli (Besredka) in each 1 cc. Of this he gave 1 cc., 2 c.cc., 3 cc., and 4 cc. on successive days, a total of 5 loops in 4 days. With this he had 25 per cent. relapses, which yielded at once either critically or in a 1–2 day lysis to a further 4 cc. dose. The duration of the disease was brought down to 8–10 days and the injection caused no local or general unpleasantness. So marked is the effect of the vaccine on relapses that it could be used diagnostically on a rising temperature in convalescent typhoid cases, failure to affect the temperature indicating a complication and not a relapse.

J. H. S.

Dubarry (J. P.). **Document sur la vaccination antityphoidique par la voie gastro-intestinale.**—*C. R. Acad. Sci.* 1915. May 25. Vol. 160. No. 21. pp. 690–692.

Amongst the prisoners of war at Toulouse there was a series of cases of typhoid in the different cantonments, and vaccination was ultimately carried out. In many cases the prisoners were in a state so feeble that the usual method seemed inadvisable, and in 373 vaccine was administered in pill form by the mouth. The results were, so far as could be gathered from the subsequent reports, very satisfactory.

J. H. S.

Jacob (P.). **Die Neosalvarsantherapie beim Typhus abdominalis.** [Treatment of Typhoid by Neosalvarsan.]—*München. Med. Woch.* 1915. June 15. Vol. 62. No. 24. pp. 808–811. With 3 charts.

In 25 cases neosalvarsan was injected intravenously in dose of 0·15 or, more often, 0·3; no ill effects of any kind were observed. Four of these cases turned out eventually not to be typhoid, but the remainder were all of severe or moderately severe enteric, mostly in the second or third week. "In consequence of months of previous military operations they were all in a high degree of exhaustion and presented, if no other worse complication, always an extensive bronchitis." On the complications, such as bronchitis, pneumonia, etc.,

the treatment had no direct effect, nor, it is said, did it affect paratyphoid infections. But on the enteric the effect was pronouncedly beneficial. In patients in the worst form of the "typhoid" state the change in 24–48 hours was most striking, all symptoms of intoxication disappearing and not returning. The temperature usually fell, though the existing complications might keep it high in some cases; but the author lays most stress on the good influence on the general condition and this indirectly affected the complicating conditions favourably. There were no rigors or sweats, no haemorrhages, and he had no relapses in his series. J. H. S.

Job. **Quelques remarques sur la valeur de la constation du Bacille Paratyphique B. dans le sang.**—*Bull. et Mém. Soc. Méd des Hôpit. de Paris.* 1915. Oct. 21. Vol. 31. 3 ser. No. 29–30. pp. 790–793. With 3 charts.

The writer has isolated paratyphoid B three times from the blood in cases where there were at least other infections as well, and he suggests that this organism may have been merely a temporary and inoffensive invader. Two of these were cases where malaria parasites were found in the blood, and the symptoms yielded to quinine in a short time. The third was a case where a severe bacillary dysentery had been successfully treated with serum and the patient was convalescent, when a sudden pain in the side and a rise of temperature to 40° led to blood culture and the recovery of paratyphoid B. A lobar pneumonia with pneumococci in the sputum then developed. [The symptoms in both the malaria cases are, as described, those of a concomitant paratyphoid infection, and the last had had a bacillary dysentery—of which the type is not described. This is hardly enough ground for saying that the organism was in these cases a "banal saprophyte"; and one would wish details of the organism before accepting such a view.] J. H. S.

Goldscheider. **Impf-Milzschwellung und Typhusdiagnose.** [Enlargement of Spleen after Vaccination and the Diagnosis of Typhoid.]—*Deut. Med. Woch.* 1915. Sept. 30. Vol. 41. No. 40. pp. 1177–1179.

After a complete typhoid inoculation the spleen is enlarged in many persons, and may come two finger-breadths below the rib margin in pronounced cases. It gradually returns to normal, but the time varies in different individuals, and out of 184 soldiers, two months after their last injection it was still palpable in 11, or 6 per cent. In 121 men four months after inoculation the spleen was still palpable in no instance. In any case of suspected typhoid the significance of splenic enlargement is therefore considerably affected by the time of previous inoculation. J. H. S.

Scriba. **Ueber den Einfluss der Typhusschutzimpfung auf den Nachweis der Typhusbazillen im kreisenden Blut.** [The Influence of Vaccination on the Demonstration of Typhoid Bacilli in the Blood.]—*München. Med. Woch.* 1915. June 1. Vol. 62. No. 22. pp. 764–765.

In the institution where Scriba worked, Hohlweg had previously obtained 23 positive blood cultures by precisely the same method as

Scriba used, but the latter could obtain only one positive out of about half as many cases as Hohlweg had tried. He attributes this to the effect of inoculation in his cases, and he connects with the same fact the diminished frequency of roseolae, the absence of brain symptoms, and the generally lower temperature. Half his cases did not rise above 38°, and from these he made no blood cultures. [But the bacillus can occur in the blood without any high temperature.] He is convinced that the disease takes a milder course in the inoculated.

J. H. S.

Gay (Frederick P.). **Typhusimmunisierung.** [Typhoid Immunisation.] —*Ergebnisse der Immunitätsforschung, Experimentellen Therapie, Bakteriologie und Hygiene.* 1914. Vol. 1. pp. 231–256.

In this review of present knowledge on the subject Gay deals chiefly with the results obtained in animal experiments, which he in collaboration with others has published at various times in recent years. He gives an excellent summary of previous work, in which he fully recognises the importance of the experiments carried out by Metchnikoff on anthropoid apes. These animals however are too expensive for most workers, and he has developed a technique of experiments in rabbits, which he thinks gives an approximation to the conditions obtaining in man and allows the value of any immunising process to be estimated in a manner which is more satisfactory than the mere administration of a number of lethal doses, or any *in vitro* estimation of the antibody production by the treated animals. With a certain culture of *B. typhosus* in a standard dose he is able to produce in all rabbits which survive the injection for more than a day or two, a carrier state in which the bacilli commonly remain demonstrable in the blood or at all events remain alive in the gall-bladder. In previously well immunised animals, however, this carrier state does not develop; and he is able to estimate the value of any immunising procedure by ascertaining whether it has been powerful enough to prevent the development of the carrier state on the administration of his test dose. He has further prepared a vaccine, consisting essentially of the dried and ground bacilli precipitated by alcohol from suspension after they have been sensitised by immune serum. This he finds by his rabbit test to be at least as good a vaccinating agent as any already in use (including living sensitised bacteria, as used by Besredka), and better than most. This preparation he has employed in man on a large scale, injecting three doses at short intervals (the process being over in a week), and the reactions have been remarkably slight. As to what degree immunity is established in men, data are not yet fully available. It is not absolute, and Gay hopes to improve still more on the preparation; but he has devised a skin reaction analogous to the von Pirquet tuberculin reaction, which gives some indication of the state of the individual's immunity. [It is impossible here to refer to many points of interest discussed in this article, which brings together much of the large experience on this subject of Professor Gay.]

J. H. S.

Sawyer (Wilbur A.). **The Efficiency of Various Anti-Typhoid Vaccines.**—*Jl. Amer. Med. Assoc.* 1915. Oct. 23. Vol. 65. No. 17. pp. 1413–1417.

It is sometimes maintained that the evidence in favour of antityphoid inoculation, being largely based on military experience and more particularly on that experience in time of peace, is hardly applicable to civilian conditions where the hygienic circumstances may be much worse and the exposure to mass infection by water, milk or contact is often higher. It would certainly be valuable to have reliable information in regard to the degree of infection conferred against exposure to really heavy infection, but this can hardly be obtained from civil statistics. Inoculation is rarely carried out in communities on any extensive scale till an epidemic breaks out, and then other measures are taken; and if inoculation has been previously done before the attack, much of it is apt to be old and no longer to be regarded as satisfactory. The State Board of Health and University of California have recently attempted to get some information as to the incidence of typhoid amongst inoculated civilians, and circularised 2,400 physicians in the State with enquiries. The replies covered a total of 8,124 vaccinated, and amongst these 5 per 1,000 of subsequent infections (with 0·49 per 1,000 deaths) occurred in the period from 30 days to 2½ years after the injections. Of these nearly 5,000 received the Gay-Claypole vaccine (with 4·3 per 1,000 later infections), and 2,000 received one brand of trade vaccine (with 7·4 per 1,000 infections). This rate is high, higher than the general rate for the whole of California State, but there is no guarantee available that the vaccination was efficiently performed, or that the diagnosis of subsequent infections was always correct, and naturally the vaccines were most used just in those places where the risk of infection was greatest, and no evidence is given—probably none was available—of the incidence in the uninoculated in the corresponding districts. The unusual exposure is shown by the fact that 824 of the vaccinated were nurses, mostly nursing typhoid cases, 608 were members of households where enteric cases existed, 953 were in the midst of existing epidemics. The conclusion is reached that if widespread and severe exposure is prevented by general hygienic measures, vaccines can be relied on to reduce greatly the residual typhoid fever "especially if a large enough number of people are vaccinated to reduce contact infection to a minimum." The Gay-Claypole vaccine appeared to be rather more efficient, but the nature of the vaccinated population was such as to leave this unproved; and there was little to choose between any of the 11 preparations of vaccine used as regards severity of reaction.

J. H. S.

Percelli-Titone. **Ricerche sul potere agglutinante del siero dopo il trattamento col tetravaccino Castellani, tifo + paratifo A + paratifo B + colera.** [The Agglutinating Power of the Serum after Inoculation with Tetravalent Vaccine.]—*Riforma Med.* 1915. June 12. Vol. 31. No. 24. pp. 648–649.

Two rabbits were injected at eight day intervals with 0·5 cc. of Castellani's vaccine containing four organisms. On the eighth day

after the second injection, the agglutination titre of the serum was in the first animal 1,200 against typhoid, 1,000 against paratyphoid A, 600 against paratyphoid B, and 350 against cholera. In the second animal the titre was 600, 1,200, 1,200 and 600 against the same organisms. Another experiment was made on a man, who was given 0·5 cc. as a first and 1 cc. as the second injection, and 0·5 cc. as the third. Eight days after the second injection the titre of his serum was 500, 500, 600 and 60; and by the second day after the third injection it had risen to 600, 500, 1,000 and 100. This is comparable to the values obtained when the organisms are given separately. [The tests are presumably made microscopically, though this is not stated.]

J. H. S.

Reiss (Emil). **Der Wert der Agglutinationsprobe bei Typhusgeimpften.** [The Value of the Agglutination Test in Vaccinated Persons.]—*München. Med. Woch.* 1915. Sept. 21. Vol. 62. No. 38. pp. 1277–1279.

The ordinary Widal reaction being unreliable in inoculated persons, various attempts have been made to determine a limiting dilution of the serum (e.g. 1 in 400) which might be considered as the effect of inoculation, agglutination with greater dilution being held to indicate an active infection. Reiss points out that all such limits are quite unsafe owing to the individual variation in the extent and duration of the reaction after inoculation. He would even consider a negative reaction to be of little value in excluding typhoid in such cases, and quotes an instance where a previously high titre fell to zero on the onset of an attack of the disease. Infection by another organism, moreover, may cause the pre-existing typhoid titre to rise or fall (as has been found to occur, e.g. in dysentery), and therefore the assumption that a variation of the typhoid titre in the previously inoculated indicates an infection with *B. typhosus* may lead to serious errors in diagnosis.

J. H. S.

Conte (Giuseppe G.), Sestini (L.) & Trocello (Enrico).—**Sulle reazioni cliniche e sierologiche per vari tipi di vaccino antitifico e antiparatifico.** [Clinical and Serological Reactions in Various Types of Anti-Typhoid and Anti-Paratyphoid Vaccine.]—*Ann. di Med. Nav. e Colon.* 1915. July-Aug. Ann. 21. Vol. 2. No. 1–2. pp. 23–49.

This is a record of a series of tests carried out by the Italian Naval Medical Service with eight different antityphoid vaccines, to ascertain the amount of the reactions produced by the injections and the agglutinin production in the sera of the inoculated. In some instances the development of bacteriotropins was also investigated. Six of the vaccines were prepared in Italy and two by other makers, and it is sufficient to say that those issued by Wright and Kolle were found in no way inferior and in some respects superior to the others. Details are also given of ten men inoculated with a trivalent vaccine against *B. typhosus* and *B. paratyphosus* A and B, prepared exactly in the manner and doses recommended by Castellani. This was found to produce no more severe reaction than the other monovalent vaccines.

The sera against typhoid gave titres of 1.280 1,600 (perhaps higher in some cases), against paratyphoid A of 320–640, and against paratyphoid B of 320–640 (though not so strongly or so regularly in the last case, and sometimes not till three injections had been given).

J. H. S.

Gaehtgens (W.) **Die Gruber-Widalsche Reaktion und die Beschränkung ihrer praktischen Verwertbarkeit für die Typhusdiagnose.** [The Gruber-Widal Reaction and the Limits of its Practical Utility in the Diagnosis of Typhoid.]—*München. Med. Woch.* 1915. June 29. Vol. 62. No. 26. pp. 878–880.

The writer had occasion to examine the blood of 273 persons who had been exposed to infection in an epidemic of mild diarrhoea suggesting a dysentery, and he tested the sera against the bacilli of Shiga, Flexner, Y, typhoid, paratyphoid B, and Gaertner. The result of this was to indicate that the epidemic had been due to *B. dysenteriae* Y; but there was a very marked group reaction as well. Of 56 sera which agglutinated Y in 1 in 320, 19 agglutinated Flexner in 1 in 320, and 23 in 160; 7 did Shiga in 1 in 80, and one in 1 in 160; 17 did typhoid in 1 in 80, 7 in 1 in 160, and 6 in 320; 7 did paratyphoid B in 1 in 80, 1 in 160 and 1 in 320; and 7 did Gaertner in 1 in 80, 3 in 160 and 1 in 320. The patients had not been inoculated against typhoid, and there was no reason to think there was any other cause than group-agglutination to account for the results; but they indicate how much care is necessary in establishing a diagnosis by agglutination alone. Except in some instances with Flexner the group agglutination did not reach so high titres as those for Y.

J. H. S.

Carbonell (M. V.). **Ueber eine neue Methode des Nachweises des Typhusbazillus im Wasser.** [A New Method of Demonstration of the Typhoid Bacillus in Water.]—*Wien. Klin. Woch.* 1915. Sept. 16. Vol. 28. No. 37. pp. 997–998. With 1 text fig.

Into a tube of 18 cm. length and 3·5 cm. diameter is placed a second tube of 14 cm. and 2 cm., the latter open at both ends and narrowing and recurved at the lower end. In the lower end of the open tube is packed fine sterilised washed sand to a depth of 4 cm., the outer tube is plugged and the whole sterilised. For use the outer tube is filled with 1 per cent. glucose broth, tinged with neutral red, and when the sand has got moist, the inner tube is filled with a bile culture made from the precipitate obtained from the water under examination by Muller's method (Liq. ferri oxychlorat.). This precipitate is treated with bile in the manner recommended by Dithorn and Gildemeister, and the bile added to the inner tube and the whole incubated for 15–24 hours. In a litre of water to which 1/100 millionth of a loop of typhoid was added, he isolated the bacillus from the glucose broth, whether *B. coli* was present in the water or not; and he states that he has succeeded in isolating typhoid from drinking water in this way.

J. H. S.

Schmitz (K. E. F.). **Ein neuer Elektivnährboden für Typhusbacillen.** [A New Differential Nutrient Medium for Typhoid.]—*Cent. f. Bakt.* 1. Abt. Orig. 1915. June 28. Vol. 76. No. 4. pp. 306–319.

After allowing ox-blood to clot the serum is poured off and to the weighed clot twice as much water is added, and this is boiled. After filtering, the usual ingredients, such as peptone are added, and 3 per cent. agar. When the latter is dissolved, 20 per cent. of the original serum is added and the whole sterilised once. The Conradi-Drigalski or Congo-red indicator may be added. On such a medium the author obtained surprisingly good results with mixtures of typhoid and colon bacilli, many colonies of typhoid growing on the Congo-red serum medium from a mixture which contained 10 million *Coli* to every 1 typhoid bacillus. If 0·6 per cent. caffein is added, the *Coli* were almost entirely inhibited, but the typhoid still came up. J. H. S.

Burnet (Et.) & Weissenbach (R. J.). **Valeur des renseignements fournis par la culture en gélose à l'acétate de plomb, pour la différenciation des bacilles typhique, paratyphique A et paratyphique B. Comparaison avec les résultats obtenus par l'agglutination, dans l'identification de 517 échantillons de bacilles typhiques et paratyphiques.**—*C. R. Soc. Biol.* 1915. Nov. 19. Vol. 78. No. 17. pp. 565–568.

The writers, while recognising that agglutination is the best and conclusive test of differentiation, state that in 20 strains of *B. typhosus*, 393 of *B. paratyphosus* A and 104 of *B. paratyphosus* B., isolated during the present war, the diagnosis obtained by the use of lead acetate medium and neutral red glucose agar (with or without broth to which lactose and and carbonate are added) agreed invariably with the agglutination test. The acetate medium is made by taking a fresh sterile solution of neutral lead acetate, dissolved 1 in 10 in distilled water, and adding 1–20th cc. of this to 4 cc. of melted agar. The tube is inoculated when cooled down by inserting the platinum loop between the wall of the tube and the medium. Paratyphoid B turns black along the needle track in 18 hours; in typhoid the black does not appear so early (24 hours); paratyphoid A does not produce a black line at all or not for some days. [One might feel more confidence in the results recorded if the writers had not said "an organism which ferments glucose and does not produce gas on the lactose broth is a paratyphoid," a statement amazingly far from being correct.]

J. H. S.

Latham (Oliver). **An Expeditious Bedside Modification of the Widal Test.**—*Med. Jl. Australia.* 1915. Aug. 7. Vol. 2. 2nd Year. No. 6. pp. 121–122.

This is a modification of the Bass-Watkin method, using serum instead of whole blood. One volume of serum is mixed on a slide with three volumes of water (tap or distilled) and four volumes of a typhoid bacillus emulsion containing 10,000 millions per 1 cc.; the whole is mixed well, and the slide tilted from side to side and end to end. In two minutes clumping is visible to the eye, if the serum is positive. The emulsion can be kept in bulk with 1 per cent. formalin added, and remains good for six months or more. The author states that he finds it as good as the usual Widal method. J. H. S.

PELLAGRA.

SANDWITH (F. M.). **Presidential Address on Pellagra considered from the Point of View of a Disease of Insufficient Nutrition.**—Delivered before the Society of Tropical Medicine and Hygiene on Oct. 15th, 1915.—*Lancet.* 1915. Oct. 23. pp. 905–909.

Dr. Sandwith commences by outlining four prominent theories of the causation of pellagra which are under consideration to-day :—

(1) That the disease is in some way associated with maize.

(2) That pellagra is a protozoal disease probably transmitted by a Simulium or some other insect. He writes that up to the present there is no more evidence that pellagra is insect-borne than the rewas when Dr. SAMBON first suggested the theory in 1905.

(3) The theory of Professor ALESSANDRINI, which has been provisionally accepted by the Pellagra Commission of the Province of Rome in preference to the two preceding. This worker writes that pellagra is induced by " chronic poisoning brought about by the silica in colloidal solution in waters of determined composition." Human pellagra, in his view, is an acidosis and can be cured or greatly improved by the administration of citrate of sodium. Dr. Sandwith points out that the Nile water solids, analysed in October, show 1·33 grains of silica out of the total solids of 8·59 grains per gallon. Moreover, all the drinking water comes from the Nile and not from clayey districts.

(4) TIZZONI's streptobacillus, which has not been found by other microscopists.

He proceeds to recount the evolution of his own ideas regarding this disease since 1890, when he became teacher of clinical medicine at the Kasr-el-Ainy hospital at Cairo. He then found that " pellagra in Egypt was confined to the poorest Egyptians, mostly agricultural labourers, with a decided sprinkling of lunatics." In 1895 he visited Italy, where the disease was apparently confined to the poorest peasants gathered into retreats and to lunatics, and the ordinary private or hospital physician seldom came across it. He was then converted to the belief that pellagra was due to deteriorated maize. In 1907 he became convinced that beriberi was in some way caused by a one-sided rice diet and it then occurred to him that pellagra might be due to some deficiency of nutrition connected with the maize diet, that, in fact, pellagra might be caused " not by what a man eats, but by what he fails to eat."

He then indicates several points of resemblance between beriberi and pellagra and among them that both diseases in endemic countries affect the labouring classes. He gives a list of the diseases due to some specific diet deficiency and suggests that the time has come when pellagra may be provisionally included. He writes :—

" It cannot too often be repeated that all early sane cases of pellagra can be cured, or apparently cured, by removal of patients from their homes to an institution where they are fed on a liberal diet containing meat, and where, for precaution's sake, all maize is excluded from the diet. There is no exception to this rule, excepting some rare fulminating cases which die in a few weeks. Rest and improved diet seem to be responsible for the change, not the removal of the patient from his home. If necessary,

this point could be easily settled, say, in America, by removing 100 patients to an institution and treating another 100 patients in their homes with obligatory rest and a similar improved diet."

He then turns to American experience and gives an account of the views of GOLDBERGER, WARING and WILLETTS [this *Bulletin*, Vol. 5, pp. 55 and 67]. These authors concluded that pellagra is essentially of dietary origin, the fault being that the animal or leguminous protein component was disproportionately small and the non-leguminous vegetable component disproportionately large. They pointed out that soldiers and sailors in the public services never suffer from pellagra unless they had it before entering, and that no nurse or attendant in a hospital, pellagra asylum, or lunatic asylum in any country has so far been known to contract the disease. These facts, Sandwith thinks, are in themselves a strong argument against the communicability of pellagra. He refers also to the work of GRIMM [this *Bulletin*, Vol. 1, p. 686] and criticises the so-called feeding experiments at the Peoria State Hospital. He gives an illustration of the association of pellagra and ankylostomiasis. In 1914 he had the opportunity of examining 300 male patients under treatment for ankylostomiasis at the C.M.S. Hospital in old Cairo. Of the 300, 138 and probably a larger number were suffering from pellagra, that is, 46 per cent. He suggests that symptoms due to deficiency of nutrition may occur more early in an anaemic person than in a healthy one.

With regard to maize, it is necessary to find out " whether good maize or bad maize alone can keep a human being in health and what are the essentials absolutely necessary as an added diet to keep a healthy man at work." With a view to throwing light on these problems he and Dr. H. MACLEAN have experimented on guinea-pigs. A quantity of spoilt maize was obtained from Lower Egypt. The experiments are detailed; 75 guinea-pigs in all were used. It is concluded that " bad " maize does not produce any deleterious results in short periods of a month to six weeks, which " throws out of court all the short experiments so prevalent in the literature about pellagra."

A. G. B.

GOLDBERGER (Joseph) & WHEELER (G. A.). **Experimental Pellagra in the Human Subject brought about by a Restricted Diet.**—*U. S. Public Health Rep.* 1915. Nov. 12. Vol. 30. No. 46. pp. 3336–3339.

A most interesting account " of an experiment planned to test the possibility of producing pellagra in the healthy human, white, adult male, by a restricted, one-sided, mainly carbohydrate (cereal) diet."

The experiment was carried out on convicts, who voluntarily subjected themselves to the necessary restrictions of diet on condition that the experiment should be followed by a free pardon. A squad of twelve men was chosen and kept under careful observation for over two months; during this time, in which the possibility of any pre-existing pellagra was excluded, the men lived on ordinary diet and became accustomed to the routine of labour and discipline which was to continue during the course of the experiment. The experimental

diet was then introduced. The nature of this diet, which did not materially vary from day to day, is sufficiently indicated by the following sample menu for one day :—

" Breakfast.—Biscuits, fried mush, grits and brown gravy, syrup, coffee with sugar.

" Dinner.—Corn bread, cabbage, sweet potatoes, grits, syrup.

" Supper.—Fried mush, biscuits, rice, gravy, cane syrup, coffee, sugar."

After a few months, one of the twelve volunteers developed prostatitis and had to be released. The remaining eleven were fed on the special diet from April 19th, 1915 to October 31st, 1915. They performed the same work and lived under the same general conditions as twenty other convicts whose food consisted of the ordinary prison fare ; these acted as a control. Special precautions were taken to prevent any tampering with the experiment. The results were as follows :—

" Of the 11 volunteers, not less than six developed symptoms, including a ' typical ' dermatitis, justifying a diagnosis of pellagra. The nervous and gastro-intestinal symptoms were mild but distinct. The dermatitis was first noted between September 12 and September 24, 1915, or not later than five months after the beginning of the restricted diet. It is of great interest to note that in all our cases the skin lesions were first recognized on the scrotum. Later there appeared lesions on the backs of the hands in two cases and the back of the neck in one case. The scrotal lesions conformed to the type described and figured by Merk.* This experience would suggest that the scrotal lesion is a much more common early skin manifestation than has heretofore been believed. It would probably have escaped us but for the fact that it was our routine to examine these men, and the special control group, completely stripped.

" No person in the ' camp ' not of the volunteer squad has presented evidence justifying even a suspicion of pellagra."

H. Maclean.

GOLDBERGER (Joseph), WARING (C. H.) & WILLETS (David G.). **The Prevention of Pellagra. A Test Diet among Institutional Inmates.** —*U.S. Public Health Rep.* 1915. Oct. 22. Vol. 30. No. 43. pp. 3117–3131.

An account of experiments in two orphanages and one asylum where pellagra was endemic. In one orphanage, 79 cases of the disease were observed during the spring and summer of 1914 ; in the other orphanage, 130 cases were recognised during the same period. In September 1914 the diet was considerably modified and a decided increase made in the allowance of fresh animal meat and leguminous protein food : the milk supply was also increased and eggs were used freely, while the breakfast cereal (grits) was substituted by oatmeal. As the result of this change no case of pellagra (recent admissions excluded) occurred in the first orphanage during this year, and in the second orphanage only one case was recognised.

Somewhat similar changes of diet in an asylum gave equally satisfactory results. No recurrence of the disease in any of 72 pellagrins in the Institution was detected, while out of 32 control pellagrins kept on the old diet, as many as 15 presented recurrences. In the case of all these experiments, the only change made was in the diet ; the

*"MERK (Ludwig). Die Hauterscheinungen der Pellagra. Innsbruck, 1909, p. 24, fig. 6."

environment, sanitation and general conditions remained as before. Applying these observations to the prevention and treatment of pellagra, the following recommendations are made :—

" 1. An increase in the diet of fresh animal and leguminous foods, particularly during the late winter and spring. . . .

" 2. A reduction in the diet of the carbohydrate (starchy) foods."

H. M.

GARRISON (Philip E.) & SCHULE (Paul A.). **A Statistical Study of Personal Association as a Factor in the Etiology of Pellagra.**—*Southern Med. Jl.* 1915. Aug. 1. Vol. 8. No. 8. pp. 655–659.

This paper is to try and determine the actual frequency of the occurrence of multiple cases of pellagra in a single household, as compared with the frequency of single cases. A total of 194 families was examined, consisting of 1,023 individuals, living in cotton mill villages, of whom 310 were suffering from pellagra.

The following conclusions were reached :—

" 1st. In the endemic centres studied, 42 per cent. of the pellagrous households presented multiple cases. Sixty per cent. of the cases occurred two or more to the household.

" 2nd. The age and sex distribution of both first and subsequent cases in the household corresponds roughly with the distribution in general population. Adult females form a considerably larger proportion of first cases in the household than of subsequent cases.

" 3rd. When the first case in the household is a house-wife or a child, there is a much greater tendency for the development of subsequent cases in children. When the first case in the household is a wage-earner, subsequent cases in children are extremely rare.

" 4th. The time interval between the first and subsequent cases in the household is quite variable. Twelve months is the interval most commonly observed."

[This paper lacks completeness, because no mention is made of the diet of the families, nor whether each individual of the family ate the same class of food as the other members. Did the adult females, for instance, eat meat in the same proportion as the men ?]

F. M. Sandwith.

KNOWLES (Frank Crozer). **Pellagra in Childhood.**—*Amer. Jl. Med. Sci.* 1915. June. Vol. 149. No. 6. (No. 519). pp. 859–865.

With the exception of one case reported in a boy of five years of age, who came to a hospital in Philadelphia, this paper is an interesting compilation of what many authors have written about pellagra among children.

" Conclusions. Pellagra is of rather frequent occurrence in childhood. In endemic neighborhoods approximately 10 per cent. of the cases occur in children. The disease is rare under two years of age.

" The affection is almost evenly divided between the two sexes in childhood.

" The negro is far less susceptible to the disease than is the white individual, particularly in early life.

" In endemic neighborhoods in about one-half of the cases two or more members of one family are attacked (Siler and Garrison).

" In a considerable number of cases in children, pellagra follows shortly after the exanthemata, particularly measles. In the South, pellagra in children frequently develops in those with hookworm.

"The skin eruption in childhood is quite marked, while in a considerable proportion of cases the gastro-intestinal and nervous symptoms, particularly the latter, are comparatively mild.

"Although formerly the death-rate in children was rather high, at present the disease occurs in a much milder form and the mortality is low.

"Heredity plays no part in pellagra excepting, by lowering the general resistance of the child, the disease is more readily contracted.

"The typical cutaneous outbreak or an accurate history of its former occurrence is essential in making the correct diagnosis of pellagra."

F. M. S.

Galloway (E. H.). **Pellagra in Mississippi.**—*Southern Med. Jl.* 1915. Aug. 1. Vol. 8. No. 8. pp. 691–692.

This is a serious warning from the Secretary of the Mississippi Board of Health to physicians. For the year 1914 there were 10,954 cases reported in the State as compared with 6,991 in 1913. The number of pellagra deaths similarly rose from 795 to 1,192, being exceeded only by tuberculosis and pneumonia. It is emphasized that the duty of every doctor is to feed pellagrins on lean meat, milk, eggs, beans and peas, and more peas and beans should be grown by farmers.

F. M. S.

Dorsey (Rufus F.). **Pellagra. The Cause and the Cure.**—*Southern Med. Jl.* 1915. Aug. 1. Vol. 8. No. 8. pp. 682–686.

The author, in Georgia, has treated 32 cases of pellagra and has come to the conclusion that it closely resembles influenza, and is due to the poisoning of the economy by neurine (or muscarine) which is formed as a result of putrefaction within the tonsils. All cases should, therefore, undergo complete tonsillectomy.

F. M. S.

Johnson (J. Clarence). **The Symptomatology, Etiology, Pathology and Treatment of Pellagra.**—*Southern Med. Jl.* 1915. Apr. Vol. 8. No. 4. pp. 279–289; May. No. 5. pp. 366–375.

This is a very discursive account, written by a Professor of Gastro-enterology, based on 50 cases treated in his private practice. He omits changes in the central nervous system and all reference to morbid anatomy. He is not converted to the insufficiency of nutrition theory and believes that factors second to none in importance are "absence of hydrochloric acid, ptosis and dilatation of the stomach."

F. M. S.

Harrison (J. H.). **Pellagra: with Report of Case.**—*Kentucky Med. Jl.* 1915. June 1. Vol. 13. No. 7. pp. 294–296.

The author has seen ten cases of pellagra, two of which he failed to diagnose some years ago; seven were seen in the Hopkinsville Asylum in 1912, and the tenth is now reported. This patient recovered after Fowler's solution and juice extracted from beef steaks.

The writer says that the disease is "almost exclusively confined to the peasantry of the oriental countries" and considers that the source of pellagra is soil pollution. He also believes that the focus is in the colon and is parasitic in nature, the parasite passing through the intestinal wall in the state of a spore.

F. M. S.

Thomson (W. F.). **Pellagra ; its Cause and Prevention.**—*Texas State Jl. Med.* 1915. Aug. Vol. 11. No. 4. pp. 220–221.

This writer says he has only seen one case of pellagra during the past year, but he tells us some of the varied beliefs of Texas physicians. In spite of the diversity of their views he states : " the theory that the disease is nutritional and due to lack of sufficient protein food, seems now to be quite generally accepted in America." F. M. S.

Wood (G. H.). **Pellagra Status in Panola County, Miss., with Remarks on Etiology and Treatment.**—*Southern Med. Jl.* 1915. Aug. 1. Vol. 8. No. 8. pp. 662–666.

The writer of this paper comments very properly upon the prevailing habit of not diagnosing pellagra until the skin eruption appears. He points out that in this way the opportune time for treatment is frequently lost, and also that suicide or homicide, giving rise to medical legal difficulties, might occur in a patient whose skin eruption was delayed. He also combats the habit of some practitioners in eliminating sugar improperly from the diet. He cannot agree that pellagra as a medical disease is frequently relieved by surgery, for it has been gravely pretended that a surgical operation sets up a leucocytosis, thereby relieving the pellagra symptoms. He considers that the intelligent land-owners of the south are indirectly responsible for more deaths than all the inmates of penal institutions. " It is their duty to furnish comfortable, well-screened houses, and to see that the food is sufficient and properly prepared." He inclines to the belief that pellagra is an intoxication which gains entrance through the alimentary canal. F. M. S.

Frayser (Benj. Hobson) & Smith (David O.). **Pellagra in Panama.**—*Southern Med. Jl.* 1915. Aug. 1. Vol. 8. No. 8. pp. 678–682. With 1 chart.

More than one hundred fatal cases of pellagra have occurred in Panama among the natives and the imported West Indians since 1909. Their food consists chiefly of yams, sugar cane, plantains and native fruits, and they eat very little meat, even in hospital, where fresh meat is provided for them. The authors recommend as treatment, rest in bed, fruit juices, meat broths and milk at the beginning and then a carbohydrate-free diet of fresh meat and vegetables. They find cacodylate of sodium, given intramuscularly, a help. F. M. S.

Marchman (O. M.). **A Pellagra Clinic.**—*Texas State Jl. Med.* 1915. Aug. Vol. 11. No. 4. pp. 223–229.

Twenty-five patients and 250 physicians attended this symposium. One speaker was quite certain that pellagra is an intoxication, the next had no doubt that it was insect-borne, while a third maintained that it occurred through the medium of the soil and had been imported from Europe. Two physicians praised very highly picric acid, internally and applied to the skin as gauze, and one of them, Dr. C. A. Searcy, of Hempstead, maintained that picric acid is as much a specific in pellagra as quinine is in malaria. F. M. S.

Berdue (E. M.). **Pellagra in the United States.**—*New Orleans Med. & Surg. Jl.* 1915. Sept. Vol. 68. No. 3. pp. 161–168.

The author, a Professor of Tropical Medicine at the Eclectic Medical University of Kansas City, writes in apparent confirmation of Professor Alessandrini's theory, though the paper is put forward as his own, based on studies of the United States Geological Survey. The Italian works are not mentioned but it is stated that in Italy and in the United States, dogs, cats and cattle have pellagra as well as man.

The conclusions are : —

" 1. Pellagra is a chronic intoxication caused by colloidal silica in drinking water.

" 2. Pellagra is strictly localized and contracted in those regions where the water commonly drunk by the people is derived from clay.

" 3. Pellagra is prevented by drinking hard water. Lime can be added to soft water.

" 4. Pellagra is cured by the administration of any alkali which will neutralize the silica.

" 5. The simplest treatment is the hypodermic administration of a 10 per cent. solution of sodium citrate, once a day at first, later on alternate days.

" 6. The remedy has been successful when administered by the mouth. This method requires more, and a longer time."

F. M. S.

Meredith (Duane). **A Further Report upon the Etiology of Pellagra.** —*Med. Rec.* 1915. Aug. 21. Vol. 88. No. 8. Whole No. 2337. pp. 312–315.

The author has seen some ten cases during the last six years in Texas and has heard of nearly forty others from patients and doctors. He has never had the opportunity of making a post-mortem examination. but he considers he has " a message that will be worth a great deal not only to the medical profession, but to the human race in general."

In 1913 he claims to have obtained an organism from the blood culture of a feverish pellagrin ; he injected this intraperitoneally into a chicken, which became emaciated and was " very nervous before expiring."

A Rhesus monkey was inoculated subcutaneously with one cc. of blood serum culture, after which it lost appetite and weight and had a temporary increase in the pigment of his hands and face. The author thinks that his organism " probably belongs to an unknown fungus family, in which there is a double cycle as occurs in the moss family." He states that the human cycle, as worked out through his cultures, " takes place in about the following manner : The spores of this organism are deposited in the deepest layer of the skin by some blood-sucking insect, where they begin to grow by sending out long fine mycelia that enter the lymph spaces along the basement membrane." He believes both in Sambon's theory and the maize theory and he found an organism similar to his own " in some bole worms in green corn (maize) that grew close to several cases of pellagra."

He states that his work upon this organism has been done with the most rigid technique. He thinks that " Tizzoni has been working with this organism, but he has studied only one cycle and has used too dry a medium to get typical growth."

[The author describes himself as Formerly Assistant Professor of Bacteriology, Fort Worth University.]

F. M. S.

Bird (R. Lee). **Pellagra.**—*Kentucky Med. Jl.* 1915. Aug. 1. Vol. 13. No. 9. pp. 385–387.

The author considers that the "50 species of fleas in the United States" should be looked upon with grave suspicion for the spread of pellagra. He believes that the true death-rate of pellagra in the States is 10 per cent. because the usual figures quoted, 30–65 per cent. are derived from asylum statistics where only the last stages of the disease are treated.

[There is nothing to praise in this paper.]

F. M. S.

Bond (H. E.). **The Causation and Treatment of Pellagra.**—*Jl. Trop. Med. & Hyg.* 1915. Oct. 15. Vol. 18. No. 20. pp. 229–231.

Writing from the Jamaica Lunatic Asylum, the author advances the old belief that pellagra is a gastro-intestinal auto-intoxication, or alimentary toxaemia, modified by the sun's active rays. "It would seem quite possible that whatever may be the toxin or toxins in the gastro-intestinal tract that may be the primary cause of pellagra, it is evident that these toxins act on the sympathetic nervous system in the intestines, then on the chromaffine cells and tissue, which, by their close connection with the central nervous system, produces the pigmentation called pellagra, with its resulting degeneration and neuritis." His conclusions are :—

"(1) That pellagra is a disease akin to Addison's disease.

"(2) That the causal bacterium is in the intestines, as indicated by the amounts of indol and skatol present, and that it primarily affects the sympathetic nervous system and secondarily the central nervous system.

"(3) That there are factors in the actinic rays of the sun which can act as irritants to the exposed surface of the skin so as to intensify the condition.

"(4) That it responds to treatment by gastro-intestinal antiseptics internally, and externally by the usual protective ointments."

F. M. S.

Tizzoni (G.). **Sur la Nature Infectieuse de la Pellagra. Résultats de Recherches faites en Italie et en Bessarabie.**—*C. R. Acad. Sci.* 1915. Mar. 29. Vol. 160. No. 13. pp. 398–400.
Die Pellagra in Bessarabien.—*Cent. f. Bakt.* 1. Abt. Orig. 1915. May 14. Vol. 76. No. 4. pp. 48–50.

The author was able to find in 17 new cases the presence of his streptobacillus in the blood and sometimes in the cerebro-spinal fluid and organs of pellagrins. This confirms the findings of 150 other observations often published by him. He found no difference between his bacteriological results in Italy and those in the south-west corner of Russia.

F. M. S.

Tizzoni (Guido) & de Angelis (Giovanni). **Significato ed importanza del polimorfismo nella identificazione e classificazione dello streptobacillus pellagrae (T.).** [The Significance and Importance of Polymorphism in the Identification and Classification of the Streptobacillus pellagrae (T.).]—*Malaria e Malat. d. Paesi Caldi.* 1914. July-Aug. Vol 5. No. 4. pp. 223–231.
Bedeutung des Pleomorphismus bei der Identifikation und Klassifikation des Streptobacillus pellagrae (T.).—*Cent. f. Bakt.* 1. Abt. Orig. 1915. May 14. Vol. 76. No. 1. pp. 47–48.

The authors make another persistent attempt to tell us under how many forms this elusive micro-organism may be seen and they promise us another longer paper on the same subject, which will be illustrated by micro-photographs.

The normal type is said to be a schizomycete, subdivided into a streptococcic form, a bacillary and a staphylococcic form, or even a mixture of any two of these.

The abnormal type is a mycelium, again open to much diversity, owing to involution. The authors claim in their laboratory in Bologna to have thrown light upon the relationship of their streptobacillus with the lower hyphomycetes and its difference from streptococci.

F. M. S.

Rivista Pellagrologica Italiana. 1915. Sept. Vol. 15. No. 5. pp. 65–70.—**L'Azione della Commissione pellagrologica provinciale di Udine durante l'anno 1914.**

This is an annual report mentioning various details of propaganda among the peasants: demonstration of the fact that maize cultivated in 50 days is of doubtful value as a food, encouragement of potato cultivation, drying chambers for maize, a school of domestic economy, inspectors' visits to markets and railway stations, ovens for cooking maize, free distribution of seed and of food to the poorest, and the issue of 94,564 kilogrammes of salt in this province. F. M. S.

Rivista Pellagrologica Italiana. 1915. Sept. Vol. 15. No. 5. pp. 72–78.—**Relazione sui provvedimenti profilattici e curativi attuati durante l'anno 1914.**

This is the annual report of the Pellagra Commission of Vicenza province. The certified pellagrins were 1,612, besides 352 who were apparently doubtful or predisposed to the disease. Seventy-six were cured in two special pellagra asylums. F. M. S.

Alpago-Novello (Luigi). **Commissione Pellagrologica Provinciale di Belluno. Relazione del Presidente Dr. Luigi Alpago-Novello a S. E. il Ministro di Agricoltura Industria e Commercio.**—*Riv. Pellagrolog. Ital.* 1915. July. Vol. 15. No. 4. pp. 49–52.

This is the annual report of a Pellagra Commission to the Government of Italy. The inspectors are praised for having made 406 visits to examine imported and indigenous maize. Various agricultural experiments with maize were made and with substitutes such as wheat, beetroot and potatoes. F. M. S.

Volpino (G.). **Nuovi esperimenti e discussioni in difesa del monofagismo.**—*Pathologica.* 1915. May 15. Vol. 7. No. 157. pp. 247–249.

There are no new experiments here, only a criticism of recent papers by Rondoni and Ramoino, and a complaint that Italian and German authors will not give to the author the credit he desires. He maintains that he was the first in the experimental field to suggest a connection between pellagra and one-sided maize diet. Especially he objects to the credit which has been given by writers to Funk. F. M. S.

Bravetta (Eugenio). **Vitamine e Pellagra.**—*Riv. Pellagrolog. Ital.* 1915. May. Vol. 15. No. 3. pp. 43–47.

Many writers are quoted, including Funk. The author sums up by saying that good food represents the best remedy to assuage, to cure and perhaps to cause the complete disappearance of pellagra. He upholds Professor Rossi, who has suggested that Pellagra Commissions should study the disease *de novo* with this possible solution of the problem in their minds. F. M. S.

Harris (Seale). **The Digestive Symptoms of Pellagra.**—*Texas State Jl. Med.* 1915. Aug. Vol. 11. No. 4. pp. 216–219.

The author says very rightly that it is as important in pellagra as in tuberculosis to make an early diagnosis and, therefore, he draws attention to the digestive symptoms which may precede the typical eruption, though patients when cross questioned often confess to " a little sunburn on the backs of my hands every spring." He rejects the theory of insufficiency of nutrition and considers that everything points to the cause being " a gastro-intestinal intoxication or infection, due to the ingestion of a toxic or infectious agent in food." The treatment is to include forced feeding and psychic suggestion. F. M. S.

Brownson (W. C.). **An Unusual Condition of the Nails in Pellagra.**—*Southern Med. Jl.* 1915. Aug. 1. Vol. 8. No. 8. pp. 672–675. With 2 figs.

Two good photographs show a leuconychia, a white band crossing the nails transversely. The author recognizes that this condition is rare, and assumes that there must be some tropho-vasomotor cause for it. F. M. S.

Mackee (George M.). **A Case of Pellagra in New York.**—*Jl. Cutan. Dis. including Syph.* 1915. May. Vol. 33. No. 5. Whole No. 392. pp. 365–366. With 1 plate.

Though many imported cases have been reported in New York State, this is said to be only the third indigenous case. The patient, a sister of charity, was born in New York City of Italian parents. Her typical rash, diarrhoea, loss of weight and melancholia improved under the influence of rest, diet and tonics. She is said to have eaten maize meal only occasionally. F. M. S.

Drummond (J.). **Pellagra in Durban.**—*S. African Med. Rec.* 1913. Oct. 11. Vol. 11. No. 19. pp. 416–418.

This is an account of the first case ever reported in Natal; it occurred in a Kaffir shepherd, who died after about six weeks in Addington Hospital. In addition to a typical eruption, raw tongue, emaciation in spite of voracious appetite, diarrhoea, anaesthesia, twitching of muscles and delusions, he had a cavity in the upper lobe of the left lung and pyonephritis, verified by post-mortem examination.

Two other cases have been seen by the author in Durban, while Dr. Addison is quoted as having seen similar cases among prisoners in Natal in 1906 and Dr. Knight, in discussing the present paper, said that he saw a series of cases in 1907 from the Tugela Valley, though the Health Officer disagreed with his diagnosis of pellagra.

F. M. S.

Barcroft-Anderson (J.). **Notes on a Case of Pellagra.**—*S. African Med. Rec.* 1913. Oct. 25. Vol. 11. No. 20. pp. 436–437. With 1 fig.

This case is that of a coloured girl at East London, who died after 80 days. The photograph does not show the rash very well, but it looks like pellagra. Very few details are given.

F. M. S.

Ross (D. W.). **Notes on a Case of Pellagra.**—*Rev. Neurol. & Psychiat.* 1914. Vol. 12. pp. 244–249.

This author writes from the Royal Edinburgh Mental Hospital, where a case of pellagra was reported in 1909. He saw several cases of this disease in America, but he does not seem to be well acquainted with the symptoms or the morbid anatomy. A girl was admitted for the second time to the hospital, with mild delirious insanity, and exaggeration of tendon reflexes. Two months later (September) she had a severe attack of diarrhoea, accompanied by a rash on the dorsum of both hands with redness of the cheeks and forehead, described by the nurse as a "very bad sunburn." Further evidence of pellagra were the continuation of the diarrhoea, progressive weakness and emaciation, dry red tongue, mental confusion and incoherence. She died on November 26th of the same year, after diffuse clonic muscular twitchings which lasted two days. The author states that "the pathological findings are quite in accordance so far as they go with those of pellagra." But he also tells us that the spinal cord was not examined at the autopsy, which is curious and regrettable in a mental hospital. [It is difficult to tell whether this was a case of pellagra or not.]

F. M. S.

Little (E. G. Graham). **Case of Diagnosis ? Pellagra ? Addison's Disease.**—*Proc. R. Soc. Med.* 1915. July. Vol. 8. No. 9. (Dermat. Sect.) pp. 245–246.

A twelve year old boy, living in Poplar, had suffered for six months from headache, loss of appetite, vomiting and asthenia, resulting in extreme emaciation. At the time of examination there was a genera

desquamation of skin and follicular keratosis, while on the dorsum of the hands, on the nape of the neck, on the lower abdomen, genital area and upper part of thighs, there was deep walnut-hued pigmentation of the skin, but no pigmentation of the mucous membranes.

[This might be a rare youthful case of Addison's disease. It was apparently not pellagra.] F. M. S.

Smith (C. A.). **The Treatment and Prevention of Pellagra.**—*Texas State Jl. Med.* 1915. Aug. Vol. 11. No. 4. pp. 221–222.

This writer has seen 20 cases, all of which were treated with arsenical injections; they recovered, but he now thinks that the liberal diet which he insisted upon, milk, eggs, red meat, beans and peas had more to do with the cure than the drugs. He suggests, quite pertinently, that institutional treatment is as necessary for pellagra as for tuberculosis. F. M. S.

Shaw (Thad.). **The Causation and Treatment of Pellagra.**—*Med. Rec.* 1915. Aug. 14. Vol. 88. No. 7. Whole No. 2336. pp. 275–277.

The author in Texas has come to the definite conclusion that pellagra is essentially a metabolic or nutritional disease and, therefore, ought to be treated by rest in bed, hospital regime, liberal diet, including fresh meat, and tonics. He alsc advises Texans, when possible, to migrate during the summer to the snows of Colorado to get away from undue exposure to heat and sunlight. He has seen pellagra in the "untidy wards" of the Austin Lunatic Asylum, where beriberi has also occurred, necessitating the exclusion of rice from the Asylum dietary. He mentions, with disfavour, several drugs which are apparently vaunted as cures for pellagra in the United States. F. M. S.

Little (Y. A.). **The Dietetic Treatment of Pellagra, with Report of Eleven Cases.**—*Southern Med. Jl.* 1915. Aug. 1. Vol. 8. No. 8. pp. 659–662.

These eleven cases were treated in the Georgia State Lunatic Asylum, and no drugs were given except in two cases, where pepsin relieved indigestion. One woman died because she obstinately refused nourishment, and after being tube-fed she purposely vomited as much of the food as she could. The cases treated with liberal diet, eggs, milk, vegetables and beef, improved, though they included seven individuals with dementia praecox, two maniacs, one imbecile and one with great mental depression. The author considers that the treatment of the disease is wholly one of diet. F. M. S.

Booth (B. H.). **Pellagra Treated with Cacodylate of Sodium. Report of Sixteen Cases.**—*Southern Med. Jl.* 1915. Aug. 1. Vol. 8. No. 8. pp. 676–677.

These cases were mostly negroes, farm hands living on maize meal, fat meat, rice and corn syrup of a cheap quality. The author has found more success from intra-muscular injections of cacodylate of sodium than from any remedies, including arsenic, by the mouth.

F. M. S.

Finato (L.) & Novello (F.). **Trattamento profilattico contro la pellagra.**—*Riv. Pellagrolog. Ital.* 1915. May. Vol. 15. No. 3. pp. 34–38.

Trattamento profilattico della Pellagra.—*Pathologica.* 1915. May 1. Vol. 7. No. 156. pp. 221–222.

Two disciples of Professor Volpino write from a pellagra asylum in Verona that they have treated 14 early cases of pellagra on alternate days with injections of extract of maize in gradually increasing doses. They have been able to trace 12 of the patients and claim that these suffered less during the succeeding spring and summer than similar cases who had not undergone this special treatment. They therefore warmly praise this method as a prophylactic. F. M. S.

Palmer (Ernest E.) & Secor (William Lee). **The Treatment of Pellagra by Autoserotherapy.**—*Jl. Amer. Med. Assoc.* 1915. May 8. Vol. 64. No. 19. pp. 1566–1567.

The authors, writing from Texas, believe "that the benefit derived from the old-time blister in pneumonia was not due simply to counter-irritation but that its effect was due to antigen produced in the serum and re-absorbed, thus stimulating the production of antibodies." Encouraged by this belief, they have blistered the chests of seven pellagrins and have then injected one cc. of the resulting serum into the patient's arm. The treatment was repeated every week for a few weeks. It is claimed that all the seven patients improved under these injections, but three of them disappeared and "were lost track of."

F. M. S.

Niles (George M.). **Some Suggestions concerning the Treatment of the Gastrointestinal Symptoms of Pellagra.**—*Med. Rec.* 1915. July 31. Vol. 88. No. 5. Whole No. 2334. pp. 187–188.

The author has treated 800 cases of pellagra in Georgia and gives the various prescriptions which he has found of most use for inflamed mouth, nausea, indigestion, constipation and diarrhoea, all of which are caused by irritation of the central nervous system. Gastric lavage is seldom necessary. For diarrhoea, tannigen, kino, catechu and bismuth are useful, or pint enemata of pure kerosene oil on alternate days. The diet should be as liberal as practicable, and must include fresh meat and either dried beans or peas, and all maize products should be prohibited. F. M. S.

Fossier (A. E.). **Report of a Case of Pellagra treated with Tri-Sodium Citrate.**—*New Orleans Med. & Surg. Jl.* 1915. May. Vol. 67. No. 11. pp. 902–903.

The author read an article on the treatment recommended by Professors Alessandrini and Scala. He gave to a man cacodylate of soda for 25 consecutive days and also daily hypodermic injections of tri-sodium citrate. At the end of 10 weeks "all visible evidences of pellagra, the skin lesions, the mental conditions and the gastro-intestinal disorders had disappeared." He is greatly tempted to ascribe the cure to the sodium citrate.

[No mention is made of diet.] F. M. S.

Rondoni (Pietro) & Montagnani (Mario). **Lesioni istologiche nel maidismo, nel digiuno e nello scorbuto sperimentale.** [Histological Lesions after Exclusive Maize Diet, Starvation and Experimental Scurvy.]—*Sperimentale.* 1915. Aug. 30. Vol. 69. No. 4. pp. 659-696. With 2 coloured plates and 3 figs.

From experiments on guinea-pigs fed only on maize, the authors find that the organs chiefly affected are the spleen, thyroid gland and suprarenals, and after them the central nervous system; with less effect on the liver, digestive canal, kidneys, bone marrow, myocardium and lungs. Special attention is drawn to the grave lesions of organs of internal secretion, such as the thyroid, suprarenals and perhaps the pancreas, and they claim that sclerosis of the thyroid is enough to distinguish "maidism" from the results of starvation. After death from the maize diet they do not find such marked haemorrhagic lesions as in experimental oatmeal scurvy, but they do find prominently diffuse degenerative lesions of the nervous elements of the central nervous system. In spite of the comparative absence of intestinal lesions in the guinea-pigs, as contrasted with the well known diarrhoea of advanced human pellagra, they believe that their pathological studies help to admit pellagra into the group of diseases due to deficiency of nutrition. The coloured plates show that sections of the suprarenals of guinea-pigs resemble much more closely the glands of animals which have been starved than they do the normal glands.

F. M. S.

Rondoni (Pietro). **Ricerche sulla alimentazione maidica con speciale riguardo alla eziologia della pellagra.** [Maize Diet from the Point of View of the Etiology of Pellagra.]—*Sperimentale.* 1915. Aug. 30. Vol. 69. No. 4. pp. 723–797. With 9 charts.

Much of this paper consists of a resumé of the writings of various authors; sifting them and adding his own experiments the writer says that we ought to conclude that maize is an unsatisfactory and insufficient food for man and for various animals. From his experiments on guinea-pigs he thinks it likely that the anti-maize vitamine is different to the anti-scurvy vitamine. He still holds the old belief that the food value of maize differs according to the kind of maize and the district in which it is grown. Adrenalin administered to sick and emaciated guinea-pigs, by mouth, under the skin or intraperitoneally caused them to live several days longer than the control animals, which were apparently suffering from "hypo-adrenalism." In spite of the obvious difficulties he considers that the effects of a prolonged maize diet, which should be almost exclusive, should be studied on monkeys or on man. Believing that pellagra may be grouped with scurvy and beriberi, he recommends as prophylaxis the substitution for some of the maize of the peasant's diet of other cereals, potatoes, fresh vegetables, meat and milk. He says that now we can go a step further than Lombroso, who fought so valiantly to get bad maize forbidden; we must now recognize that exclusive or nearly exclusive consumption of good maize is pernicious to man and must some day be regulated by law.

Experiments were also made upon guinea-pigs and several additions were made to their maize diet, with no very conclusive results—protein, peptone, amino-acids, glucose, tabloids of thyroid gland, allantoin, etc.

F. M. S.

Albertoni (P.) & Tullio (P.). **L'alimentation maïdique chez l'individu sain et chez le pellagreux.**—*Arch. Ital. de Biol.* 1914. Mar. Vol. 62. No. 3. pp. 305–325.

The authors find that although there have been many maize observations on the healthy man, there have been relatively few on pellagrins. They state that the theory of insufficient nutrition by maize was first advanced by Lussana.

They watched very carefully in the house of one of them in Bologna a man and two boys with skin lesions and occasional diarrhoea. For four days they partook only of polenta and kidney beans, then for five days polenta only, seasoned with butter, oil, lard, tomato sauce and thin soup. Then for four days they each had 100 grammes of meat per day, with bread, rice, cheese, oil, butter and wine, while for the remaining five days of the experiment (18 in all) they were given 200 grammes of meat per day. The excreta were carefully weighed and tested and it was found that there was a loss of nitrogen per cent. on the maize diet, and again on the meat diet. The authors state that maize food is so insipid that the peasants voluntarily reduce, especially in the winter, their food to a minimum quantity; it therefore results that the diet of the peasants becomes one of the lowest known as regards nitrogen. They insist that a maize diet is insufficient for man, not from the absolute deficiency of nitrogen, but because there is a relative deficiency of the nitrogenous products which are necessary for animal albumins. The addition of 100 grammes of meat daily, they consider, "is the only method of curing and perhaps of completely banishing pellagra." [It is a pity the experiment was so brief.]

F. M. S.

Nitzesco (J. J.). **Sur la valeur nutritive du maïs de nouvelle et d'ancienne récolte.**—*C. R. Soc. Biol.* 1914. Dec. 3. Vol. 77. No. 33. pp. 583–586.

This is a communication from the Bucharest Institute of Physiology. The experiment was made on six hens for 40 days, six cocks for 41 days and six white rats for 33 days.

The excreta were examined for three or four days. The conclusions were: (1) fresh maize is less digestible and less assimilated than old maize; (2) rats stand less well than poultry an exclusive maize diet.

The old maize varied in age from one to three years.

F. M. S.

Nitzesco (J. J.). **Recherches sur l'alimentation maïdique exclusive chez les animaux.**—*C. R. Soc. Biol.* 1915. May 14. Vol. 78. No. 8. pp. 222–224.

Six dogs in Bucharest were divided into three pairs. The first pair were fed on polenta made from fresh maize; the zeinolytic ferment

appeared in the blood 100 days after the beginning of the experiment, also rapid emaciation, loss of appetite and gaiety, salivation, rash on the mucous membrane of the mouth, with liquid, slightly bloody motions. After death had occurred small ecchymoses were found under the intestinal mucous membrane. The second pair were fed on polenta made from maize one year old ; the ferment appeared in the blood after 102 days, while the symptoms and post-mortem signs were similar to the first pair ; in addition, there was an exfoliating eruption on the skin of the belly of one dog. The other dog ate comparatively little polenta and remained in good health.

The third pair were fed on bread and remained healthy and happy.

The author states that the ferments found in the blood are a proof that the dogs were poisoned by zein.

He considers that this poisoning, preceded by the alimentary insufficiency of maize, are among the chief causes of pellagra.

F. M. S.

Ruhl (Karl). **Experimenteller Beitrag zur Aetiologie der Pellagra.** [Experimental Contribution towards the Etiology of Pellagra.] – *Dermatol. Woch.* 1915. Jan. 30. Vol. 60. No. 5. pp. 113–126; Feb. 6. No. 6. pp. 151–158; Feb. 13. No. 7. pp. 176–180.

In Turin guinea-pigs, white rats and captured black rats were kept 35–40 days to make sure they were healthy, and were then fed on the best possible maize and were exposed to sunlight. A second lot were given a diet of bread, potatoes, meat, cheese, fruit, etc. for the rats, while the guinea-pigs fed on grass, cabbage, bread, lettuce, etc., and were also exposed to sunlight.

A third lot were fed at first exclusively and then chiefly on maize, and were exposed to light through red glass. A fourth lot were fed on mixed diet, excluding maize, and under the same light conditions as group 3.

A fifth group were kept in the dark and were fed on that part of the maize which, according to Funk, does not contain the vitamines. This part, consisting roughly of husk and layers of skin under the husk, was never eaten by the animals so long as they had plenty of maize. The sixth group, like the first, was exposed to sunlight, but was fed only on the parts of maize rejected by group 5, i.e. the parts alleged by Funk to be rich in vitamines. A seventh group was treated like group 6, except that they were kept under red light. The animals were kept four or five in a cage and the author points out that a loss of hair is generally caused by rubbing against the bars or by the habit of the healthier animals, who bite off the hairs of the sick ones. He found that no photodynamic reaction takes place in guinea-pigs, and that these animals are not suitable for these experiments, because they all die and nothing noteworthy was found after death, except a redness and swelling of the adrenals. Red light, even with mixed diet, delayed the development of young animals, but had no effect on adults. Red light, with exclusive maize diet, resulted in the death of 80 per cent. He believes that the red light is not harmful, but rather the exclusion of the chemically active violet and ultra violet rays. His final conclusions are that Funk's vitamine theory is non-proven and that Raubitschek is mistaken in considering pellagra to be a photodynamic problem.

F. M. S.

Antonini (G.). **L'opera di Gaetano Pini nella lotta contra la Pellagra nella Provincia di Milano.** [The Share of G. Pini in the Struggle against Pellagra in Milan.]—*Riv. Pellagrolog. Ital.* 1915. May. Vol. 15. No. 3. pp. 39–42; July. No. 4. pp. 53–54.

The Milanese authorities have lately given to one of their streets the name of Dr. Gaetano Pini in recognition of his life's work in every field of hygiene. At the age of 20 years he broke off his medical studies to fight under Garibaldi in 1866. In 1881 he was made one of four commissioners to study the best methods of fighting pellagra in the province of Milan, one of his colleagues being E. Strambio. His enthusiastic admirer tells us the various projects initiated by Pini until his early death in 1888. His personality is said to have been such that he succeeded in interesting even those of the Government who were indifferent to the pellagra problem.

[This was a gift which many would-be reformers must envy.]

F. M. S.

Book Reviews.

Gabbi (Umberto). **Trattato Elementare di Patologia Esotica ad uso di Medici e Studenti.**—xv + 347 pp. S. Roy. 8vo. With 3 plates and 69 text-figs. 1915. Roma: Tipografia Nazionale di Giov. Bertero. E. C. [Price not stated].

This is an elementary work on what are generally called tropical diseases though as is well known many maladies thus included are not confined to the tropics. Their influence, however, has been most felt by white races in the attempt to colonise, or to extend trade in hot climates. It is this fatal obstruction to progress which has called particular attention to tropical diseases and to the methods best fitted to fight or eradicate them, Professor Gabbi dedicates his book to Professor Baccelli, from whose pen comes a short introduction to this treatise by a disciple and friend. The chief point to be noticed with regard to Professor Gabbi's book is that it is issued as a text book for students and medical practitioners. It is therefore necessary to judge the contents of the book according to the wants of these two classes.

It must be clearly stated that the author makes no claim to exhaustive treatment of the subjects dealt with. In the penultimate paragraph of his preface Professor Gabbi describes the aim and purpose of his book. He states that he does not intend to give a complete picture of the present state of the pathology of tropical diseases but to set out the necessary elements. Here the reviewer may digress for a moment to point out that "Patologia" has a wider meaning than "Pathology," the English equivalent. The Italian term includes etiology, symptoms and treatment in addition to pathology as generally understood by the English student.

It may be fairly expected that a work claiming the title of "Elementary Treatise" shall contain all the known and accepted facts relating to the diseases included within its covers. Theories and disputed points may be left to more comprehensive text books or to monographs. Judged by such a standard it may be said at once that Professor Gabbi's work is on the whole, satisfactory. Generally speaking the student will find all he needs to know during the period of life devoted to examinations and until he comes under the more satisfying guidance which comes from actual research and experience. Chapters I to VII deal with infective "fevers" of bacterial or doubtful origin including "seven day fever," "dengue," "yellow fever," "typhus," "undulant fever," "cholera," "plague," and "leprosy." All these are carefully considered and each section is followed by a fairly full bibliography.

"Malta fever" (Febbre di Malta o del Mediterraneo) should not be used as the "heading" for chapter IV. The disease is not even most prevalent in that island and for many years "Undulant fever" has been accepted as the title-in-chief for the malady caused by the *Micrococcus melitensis*. The medical profession must have observed with feelings of pride and pleasure the honour lately bestowed, in the form of the Leeuwenhoek medal, upon Sir David Bruce, the discoverer of the cause of this most serious disease, Chapter IV is one of the best in the book and "undulant fever" is a malady to which Professor Gabbi has devoted much attention and concerning which he contributed a paper to the records of the International Medical Congress in 1906. Chapter V on cholera is equally good and contains the methods of treatment used with great success by Sir L. Rogers in Calcutta. Chapter VI deals with plague. It seems somewhat unnecessary and out of place to add a section on "Climatic Bubo" as an appendix to this chapter. It is generally admitted that the so-called "climatic buboes" do not contain the plague bacillus, nor are they accompanied by symptoms of plague. Indeed it would seem that the word "Climatic" is a cloak for ignorance of the true cause of these buboes. The name "Pestis minor" seems even more unsatisfactory. In accordance with Professor Gabbi's method of classification this chapter also includes leprosy and dysentery due to bacilli. The reviewer has no experience

of the sugar-reactions but, if they are always reliable, they will help the student to distinguish between the bacilli of Shiga, Flexner, Strong and Hiss for what such distinction is worth. We pass on to Chapter VII. and diseases due to pathogenic protozoa. First comes in natural sequence Amoebic dysentery and Professor Gabbi gives *Entamoeba tetragena* and *E. histolytica* as separate species. The reviewer agrees with those who regard them as one and the same. Everyone should read a concise and illuminating article on the intestinal protozoa by Dr. C. M. Wenyon which appeared in the *Lancet* for November 27th.

There is no doubt that Rogers has done well to re-introduce and to insist upon the value of emetine in amoebic dysentery. In bacillary and possibly in mixed forms of the disease if the patients are kept in bed and on "milk diet," other drugs give equally good results especially sulphate of magnesia in saturated solution.

Malaria and kala azar receive full treatment and a section is devoted to "Delhi Boil" and other sores due to infection with *Leishmania tropica*. When the section dealing with sleeping sickness and trypanosome infections was written *T. rhodesiense* was accepted as a separate species responsible for the "Nyasaland Sleeping Sickness" and carried by *Glossina morsitans*. Surgeon-General Sir David Bruce, A.M.S. believes, as stated in his "Croonian Lectures" [vide the *Lancet*, June 26th, 1915, *et seq.*] that *T. rhodesiense* and *T. brucei* "are in reality one and the same. They are identical in morphology, in their action on animals, and in their manner of development in the tsetse fly, and until further proof is brought forward that they are separate species the Commission decided to consider them as identical."

In the Bibliography at the end of this section the *Tropical Diseases Bulletin* is referred to.

Chapter IX. includes diseases due to Spirochaetae: Relapsing fever, Tick fever, Yaws and Granuloma. Verruga is considered as probably due to infection with Chlamydozoa and Barton's "bodies" as seen in the red blood corpuscles are described in Chapter XI. The description of the various forms of "Ringworm" in Chapter XII. is somewhat brief and the names given to the different species of Tricophyton are those used by Castellani. Iodine and chrysophanic acid are recommended for the treatment of Tinea but no reference is made to the value of X rays in dealing with these infections. In Chapter XIV. the various theories as to the causation of Pellagra are discussed and microphotographs of the *Streptobacillus pellagrae* of Tizzoni and De Angelis are shown, but we are still without any satisfactory conclusion as to the true cause of this disease. Thirty-six pages are devoted to parasitic worms and the sections are generally complete and well illustrated, the picture of *Cyclops quadricornis* containing larvae of *F. medinensis* being especially interesting. The section which follows on insects connected with disease is scanty and unsatisfactory, nor do the bibliographies contain any reference to the best of existing works on Entomology in medicine. The essay on beriberi is good and the theory of vitamines is fully accepted. The remaining sections deal with Vegetable poisons, Snake venom, Sunstroke, and the slow action of tropical climates. They are, like the section dealing with insects, brief and insufficient.

The illustrations are generally good and well chosen. Many are original and taken from cases observed by the author. Of the borrowed illustrations some are acknowledged and some are not referred to their source. Fig. 64, p. 285 does not show the details on the head of *Necator americanus* very plainly.

In addition to the bibliographies there is at the end of the book a list of various works consulted. It is to be noted that among these we find the following entry:—"Daniels and Wilkinson, *Trop. Med. & Hygiene*, London, 1909 (2 Vol.)" [sic.] The first volume certainly appeared in 1909, but the 2nd vol. by Daniels and Alcock was published in 1910, and the 3rd by Daniels in 1912. The 2nd volume of this work is not found in the bibliography attached to the section on Snake bite; yet Fig. 69 on page 338 of the work under review is without doubt Alcock's Fig. 94, p. 215, vol. ii. of "Tropical Medicine and Hygiene."

Professor Gabbi's book would be more useful both to practitioner and student if it was furnished with an Index. The "Indice" is merely a bare "table of contents." At the end of the book is found a list of "errata corrigenda." It is not quite complete:—On p. 106 the zoological name of the "Tarabagan" is given as:—*Arctomis bobae*; on p. 156 [Bib.] "fuerther" and "attribuited" are found and on p. 261 we find "jodio" for iodio.

J. H. Tull Walsh.

Cuervo Márquez (Luis), [Dr.]. **Geografía Médica y Patología de Colombia. Contribucion al estudio de las Enfermedades Intertropicales.** [The Medical Geography and Pathology of Colombia. A Contribution to the Study of Tropical Diseases.]—219 pp. With 1 map and 2 plates. 1915. Bogotá. New York: Libreria Colombiana, Camacho Roldan y Tamayo. [Price not stated].

This well-arranged and clearly written volume furnishes an admirable account of the medical topography and diseases of the great South American State of Colombia, a country which, as the author points out, has an area three times as great as that of either France or Germany, and therefore five times as large as that of the United Kingdom. The population at the present time amounts to about five millions of inhabitants in all, including both Europeans and those of native descent.

Colombia lies wholly between the 2nd S. and 12th N. parallels of latitude, and therefore the climate at the sea-level is strictly tropical; nevertheless on the plateaux of the highlands the climate is so rigorous that both men and animals are frequently frozen to death in blizzards. The great river Magdalena, running from south to north through the mountain chain of the Cordilleras, forms the principal means of communication with the interior of the country, though the plains of the eastern portion of the Republic are also brought into connection with the neighbouring territories of Venezuela and Brazil through the head-waters of the Orinoco and the Amazon. A very excellent map, of United States origin, forms the frontispiece to the present volume and brings all these features clearly to the notice of the reader.

The usual tropical diseases of this region of the world, such as yellow fever, malaria and ankylostomiasis, are of course prominent in Colombia, while leprosy and a special form of relapsing fever also occur. The latter is due to a species of *Spirochaeta* which is communicated by the bite of the tick, *Ornithodorus turicata*, though a bug, *Cimex rotundatus*, and *Argas reflexus* and *marginatus* are also incriminated as transmissors. Goitre is endemic in some of the higher regions of Colombia, and by the inhabitants is always attributed to calcareous drinking water, obtained from fountains or shallow wells. The city of Bogotá in former times presented a large number of cases of goitre, but since its supply of water has been altered to one derived from a stream, goitre has become relatively rare, and so with other localities. Whether these calcareous surface-springs harbour an organism which is the cause of the disease is, according to the author, a matter for consideration.

One of the ailments peculiar to Colombia is the peculiar form of alcoholic intoxication caused by drinking, in excessive quantities, the fermented beverage derived from maize, called Chicha. Chicha contains about 8 per cent. of alcohol, along with measurable quantities, say 1 to 2 per cent., of glycerine, lactic acid and dextrine. It is therefore not unlike a weak wine, and is very cheap, so that it can be consumed by drunkards in quantities varying from 2 to 3 litres per day, containing from 150 to 250 grammes of alcohol. The drinking of Chicha does not, however, seem to produce cirrhosis of the liver, but, on the other hand, it causes a peculiar eruption on the hands and feet not unlike that seen in pellagra. It also produces a peculiar form of neuro-muscular paresis of the limbs, so that voluntary movements are performed slowly and with much difficulty,

though there is not much real loss of muscular power. Patients may have to be detained in hospitals for some weeks through these symptoms, though they eventually recover, at any rate for the time.

Tuberculosis has of recent years become much more common in Colombia, from the immigration of sufferers from pulmonary phthisis in search of mountain-cures in the Cordilleras. For these there has been as yet no adequate provision made, with the result that phthisis has been disseminated among the local populations, as in other regions of the world. In the rainy tropical districts of Colombia, the parti-coloured skin eruptions, due to various species of *Aspergillus* and known as Carate, are much in evidence, and by the laity are always ascribed to bad drinking-water. A species of Simulium and one of Acanthia are the probable transmissors, as the disease is contagious.

As an adjunct to the perusal of ordinary works of travel dealing with Colombia, like Mr. H. J. Mozans' interesting book "Up the Orinoco and down the Magdalena," this account of the medical topography and pathology of the country will be found very useful.

J. B. Nias.

Ward (Espine). [M.D., B.C.H., B.A.O.]. **Beri-beri. Its Etiology, Symptoms and Treatment, with a Detailed Clinical Account of Thirty-Two Cases occurring in Sierra Leone.**—84 pp. 1915. Belfast: Mayne, Boyd & Son, Ltd. [Price 3*s.* 6*d.* net.]

This monograph of 84 pages is the author's M.D. thesis and is divided into two parts: (1) A general survey of the disease and its etiology, and (2) Observations on 32 cases of beriberi treated at the prisons of Freetown, Sierra Leone. In the discussion of the etiology the work of Braddon, Fraser, and more especially Schaumann is set out, but that of Chamberlain, Strong, Vedder and many others is ignored. The object of the author "is to show that under certain conditions hand milled rice will produce beriberi"; this really requires no long argument, for it had been frequently pointed out that the vitamine deficiency is a very complex question, and hand milled rice alone is a deficiency diet. The question of the relationship of beriberi and scurvy is just touched on, but Darling's observations are not noted.

The description of the thirty-two cases observed by the author himself is very interesting and contains much useful information, giving no support to the infective theory but strong evidence of dietary deficiency and faulty metabolism. All the patients lived on Sierra Leone hand milled rice or native rice *alone*; those taking the full prison diet were not affected. The mortality was 22 per cent.

P. W. B-S.

Harvard School of Tropical Medicine. **Report of First Expedition to South America 1913.** [Members of the Expedition:—Richard P. Strong, Ernest E. Tyzzer, Charles T. Brues, A. W. Sellards, J. C. Gastiaburu.]—xiv + 220 pp. Imp. 8vo. With 48 plates, 9 text figs. and 1 chart. 1915. Cambridge: Harvard University Press.

The greater part of this handsome volume is concerned with Oroya fever and verruga peruviana. Most of the work has been previously published and summarised in this *Bulletin*. Owing however to its obvious value and the fact that the previous accounts are scattered, it is deemed advisable to give a somewhat full summary of this portion.

In the introduction a general account is given of the route of the expedition, some of the towns visited and the diseases studied. Most of the work was done in Peru. It is pointed out that in the deep valleys separated by mountain ranges and so near the equator there is a very unusual flora and fauna and the existence of unusual diseases is not surprising.

Chapter 2 is headed General Consideration of Oroya fever and of Verruga peruviana, hitherto believed to be the same disease. An affection characterised by fever, anaemia, and a nodular eruption on the skin has been known in Peru from remote times. In a history of the conquest of Peru by ZARATE (1545) it is stated to be more destructive than small-pox. In 1870 an outbreak of fever among the workers building the Central Railway between Lima and Oroya carried off at least seven thousand; hence the name Oroya fever. CARRION'S self-experiment was made in 1885; none of the records of his case have been preserved and it has been suggested that he died of typhoid or septicaemia. In 1908 ODRIOZOLA'S monograph appeared, "the most excellent and most comprehensive account of the disease which has been written." The previous views regarding the aetiology are given, showing that at the time of the Expedition the aetiology of verruga and Oroya fever was undetermined. As a result of their own investigations the authors have concluded that these diseases are distinct, verruga peruviana being due to a virus which can be transmitted to animals by direct inoculation and produces definite lesions in them, Oroya fever being due to an organism parasitic in the red blood corpuscles and endothelial cells and sufficiently distinct from other haematozoa to be placed in a new genus. This organism has not been successfully transmitted to the lower animals.

Chapter 3 deals in detail with Oroya fever [pp. 15–56.] Knowledge of the distribution of this disease is very incomplete, it having been confused so often with verruga peruviana, malaria, and paratyphoid. The authors think it may well be found to occur in other tropical countries, the difficulty in detecting the parasite having led to its escaping recognition. The clinical features of the disease are detailed, with cases. It is pointed out that a malarial attack during the incubation stage of verruga has often led to an erroneous diagnosis of Oroya fever stage of verruga. Similarly with paratyphoid; hence the isolation of bacilli from cases of supposed Oroya fever. The authors' account of the symptoms is based on the study of apparently uncomplicated published cases and their own observations. The fever is irregular, the changes in the blood characteristic, so that the disease is sometimes termed "anaemia perniciosa de los quebradas" [ravines]; the mortality is given as from 30 to 40 per cent. A concomitant infection with verruga and Oroya fever sometimes occurs.

The section headed Description and Classification of the Parasite of Oroya fever is illustrated by several excellent plates both of fresh and stained specimens. These bodies, named *Bartonella bacilliformis*, consist of minute rods and, more rarely, of rounded bodies within the red cells. Other stages of development are found in the endothelial cells of blood vessels, particularly those of lymphatic glands, liver, and spleen. The bodies are frequently difficult to detect in fresh blood preparations. For further details the report must be consulted.

Experiments to infect rabbits (8) and monkeys (1) with blood from one or other of two human cases were negative, as were attempts to cultivate micro-organisms from the blood of two cases. The authors had no opportunity to study the manner of transmission of the disease; some experiments with mosquitoes (a new genus: *Phalangomyia*) were negative; they think it "very probable that it is transmitted by the bite of some arthropod."

The account of the pathology and histopathology is full and well illustrated. Marked changes were found in the liver, spleen, bone marrow and lymphatic glands: in the liver—extensive areas of necrosis of the central type apparently due to the action of a toxin; in the spleen, numerous infarctions; in both, as well as in the bone marrow—endothelial phagocytes containing red blood cells and polymorphonuclears, probably an indication of the presence of a toxin; in the lymphatic glands—the presence of large swollen endothelial cells, free in the lumen of the blood-vessel or still attached to the walls. The large intestine showed ulcerations with distinct undermining of the mucosa. [For further details see this *Bulletin*, Vol. 5, p. 368.]

Chapter 4 [pp. 57–160] concerns verruga peruviana. This disease is said to be confined to South America between 6° and 13° south latitude. It is probably found in Ecuador and the northern parts of Chili. It may be identical with the "angiofibroma cutis circumscriptum contagiosum" of Bassewitz, found in southern Brazil at about 20° S. It particularly affects deeply cleft, narrow valleys on the western slopes of the Peruvian Andes at 2,800 to 9,000 feet, where rain is absent during the greater part of the year. The vegetation of these is shown in photographs. The disease is most prevalent in March and April at the close of the rainy season. The causation was at the time of the Expedition quite unknown. The authors, as stated above, have demonstrated that there is a specific virus. The incubation period is given as from about 14 to 21 days. The clinical features are described at length with cases and numerous coloured plates showing the characters of the eruption. They state that the uncomplicated disease is very rarely fatal.

The experiments relating to the virus occupy 50 pages. The results of the inoculations into rabbits, dogs, guinea-pigs, and monkeys are given in tables. Large numbers of these animals were used. The monkey was most satisfactory, though the inoculation often fails. "If the skin over the eye is scarified and a small portion of a verruga nodule rubbed into the abrasions, after an incubation period usually of ten to twenty days small papules appear which gradually enlarge and later assume the typical picture of the verruga nodule as seen in human beings." The virus has been passed through twelve successive series of monkeys. No generalised eruption occurs in this animal; as in small-pox a modified form of the disease develops. Characteristic lesions may be produced in the testis of the dog and rabbit by inoculation into that organ. It would appear that the virus is only transmissible during a certain stage of the disease. The authors do not think that verruga occurs naturally in animals. The results of cultivation experiments did not give any support to the idea of a successful cultivation of the virus. In one experiment *in vitro*, however, there was a precipitate formed and what may have been a partial success was obtained on the inoculation of a monkey; if so, the virus was attenuated. The most satisfactory material is that secured directly from human cases. From the failure to find any microorganism in preparations from the lesions it would appear that the virus may prove to be a filterable one. The authors made experiments on this point but regard them as inconclusive. The similarity between the virus of verruga and that of small-pox is discussed.

Under the heading of Differential Diagnosis an experiment is described in which a Chilian volunteer was inoculated with verruga nodules from two patients. He contracted a modified form of the disease. No parasites were observed in his blood, and no anaemia developed. A portion of his lesion was inoculated into the testis of a rabbit, which developed a typical verruga lesion in that organ. This experiment clinches the proof that Oroya fever and verruga peruviana are distinct diseases.

In the account of the pathology the question of internal lesions is discussed. The authors have been able to show that some of these are lesions of tuberculosis. They have examined the pathological material at the hospital at Lima and were not convinced that any of the lesions they saw in the internal organs were of a verrugal nature. As to the histology the authors write:—"The verruga nodule constitutes a special form of granuloma characterized in the early stages by the formation of new blood-vessels in oedematous connective tissue, and by marked proliferation of the angioblastic cells forming masses or islands of closely placed cells, by the invasion of the connective tissue by lymphocytes, plasma-cells, and leucocytes, and as the lesion progresses, by the formation of fibroblasts and the deposit of collagen fibrils." There are several plates illustrating the histology.

In a short discussion on vaccination and immunity the authors express the opinion that by the use of virus passed through monkeys man may be vaccinated against the disease, or even possibly with virus obtained directly from human lesions. Animals so inoculated are immune for six months.

They go on to discuss Mr. C. H. T. Townsend's work on transmission by insects, giving quotations from his numerous writings. With regard to the dog to which he "transmitted" verruga [this *Bulletin*, Vol. 2, p. 621] the authors had the opportunity of seeing the "typical nodular eruption" and blood smears; the former "resembled in no way the lesions of verruga," in the latter "no bodies resembling the parasite of Oroya fever were observed." As regards Mr. Townsend's "Human Case of Verruga directly traceable to *Phlebotomus verrucarum*" [*l. c.* Vol. 4, p. 487] the eruption did not occur until over three months after the bites. The authors conclude:—

"Further experiments will probably show whether a species of Phlebotomus is the transmitting agent in Oroya fever. While we have some confidence in Mr. Townsend's entomological work, we feel from what we saw of his work during our stay in Peru that from a medical standpoint his observations need confirmation before they can be accepted."

They consider that transmission of verruga peruviana may be brought about by some arthropod or in a somewhat similar manner to small-pox.

Chapter 5 deals with Entomological Investigations at Matucana, a town at 7,300 feet, inland from Lima. In spite of the extremely dry environment the insect fauna, late in June, was by no means meagre. One species of mosquito was reared in large numbers from larvae in a tank; this is described as *Phalangomyia debilis* Dyar and Knab, n.g., n. sp., with figures. Larvae of Simulium were abundant; four distinct types of larvae or pupae are described. The character of *B. bacilliformis* suggests tick transmission but no ticks were found. Townsend has described a tick from viscachas in and above the verruga zone. Lastly, there are phlebotomi.

Chapter 6 is on Uta. This disease has existed in Peru since prehistoric times. It has been attributed to syphilis, leprosy and lupus vulgaris. In certain towns a large proportion of the inhabitants either have the disease or show scars of it. The affection is described with photographs of patients. The face and neck are most commonly affected, and secondary infections may lead to great loss of tissue. The disease is due to a species of Leishmania, which is figured. The parasites are easy to find at first, but increasingly difficult as the disease progresses. The authors do not feel justified in creating a new species for the parasite, as others have proposed. They cultivated it and transmitted it by inoculation to the internal surfaces of the ears of a dog.

Chapter 7 is headed Guayaquil, Sanitary Conditions and prevailing Diseases. Like other tropical towns this is flat and only a few feet above the river (Guayas). The population is estimated at 80,000. The insanitary conditions of the streets are described. It is concluded that "Guayaquil, from a sanitary standpoint, compares unfavourably with most of the notably unhealthy cities of the world." Many very advanced cases of uncinariasis were seen. Yellow fever is common but there is great difficulty in its diagnosis as "about 95 per cent. of the population are said to suffer from malaria" and the diseases may both be present in one individual; they saw two such cases. *S. calopus* could be observed at almost any part of the city by day as well as by night, but "could hardly be considered as abundant." As has been observed before, "a large Stegomyia population is not necessary for the maintenance of a constant incidence of yellow fever in a community." Breeding opportunities are slightly curtailed by the health authorities. Stegomyia larvae were not found in the water in the streets, gutters and drains. Plague is even more common than yellow fever and is said to be spreading inland; it is very mild as compared with that seen in the East. Dysentery and typhoid also prevail. Anophelines, almost absent in the dry season, are very common in the wet.

Chapter 8 treats of yellow fever, Chapter 9 of a Linguatulida found in the lung of a crocodile, *C. americanus*. It is figured and considered to be a new species, *Porocephalus crocodili*.

In an appendix the new linguatulid is described by W. M. Wheeler. C. T. Brues writes a note on some flies of the family Phoridae. On agar medium inoculated with scrapings from the skin of a negro affected with caraate dipterous larvae were found a few days later, and eventually adult flies were obtained of two species of *Aphiochaeta*. A species in India has been found to cause myiasis of the intestine and the larvae have been extracted from an Indian's foot in Honduras. F. Knab contributes notes on Peruvian Mosquitoes and Mosquito Literature, and gives an annotated list of the mosquitoes now known to occur in Peru. A short paper on Heteroptera and a list of bees conclude the Report.

The authors may be congratulated on both the excellence of their work and its presentation. It is to be hoped that the mode of transmission of Oroya fever and verruga may be soon demonstrated, as a basis of a sound prophylaxis.

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